

AN ECONOMIC APPRAISAL OF THE EEC FRUIT AND VEGETABLE GRADING LEGISLATION

Peter Bowbrick

ABSTRACT

The economic impact of the EC fruit and vegetable grading legislation is analysed in relation to market segmentation, price stabilization, new product development, control of imports, transmission of information etc. The purchasing decision at each stage of the main channels in the EC is analysed. It is found that the legislation harms producers, consumers and distributors and that, partly because the legislation has no defined purpose and attempts to achieve vague and conflicting aims, there are few compensating benefits. It prevents aggressive marketing and the development of grades appropriate to the different segments of the market. The grades carry no useful information. If the legislation were enforced, the marketing system would collapse; instead, incomplete enforcement reduces the harm. An exhaustive review of the literature also shows that economists are almost unanimously opposed to this type of grading system. An alternative system which retains any of the benefits of the present system and avoids most of its weaknesses is suggested.

This was published in 1981. The EC passed legislation putting this into action in 2009.

3/1 Cambridge Street

Edinburgh

EH1 2DY

peter@bowbrick.eu

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INTRODUCTION

EEC regulations control the sale of fruit and vegetables to 250 million people in nine countries. They cost millions of pounds each year to enforce and their effects on prices must be measured in hundreds of millions of pounds.

Every EEC policy on agriculture is subject to critical review from time to time, to see if the policy is achieving its aims, to see if any amendments to policy are required and to see if alternative policies would be more successful. This seems to be an appropriate time to review the legislation for fruit and vegetables, because the transitional period is over for the three new member states, because new member states are to join in the near future and because new developments in the theory of grading may alter conclusions previously arrived at.

This appraisal is based on detailed research into the fruit and vegetable market on two EEC countries over the last ten years plus a study of the fruit and vegetable markets of other EEC countries. The literature on the economics of grading has been analysed exhaustively and a theoretical model has been developed for the industry.

The views and conclusions expressed are in accordance with those of nearly all other economists who have studied the question and are backed up with a large amount of hard theory and fact.

In this study many aspects of the present EEC grading system are attacked. It is not suggested, though, that grading should be stopped or that it is uneconomic to produce good quality. On the contrary, I believe that grading, though not necessarily grading to EEC specifications, is necessary for efficient marketing, and that there will be more demand for top quality produce or better-graded produce in the future.

It is important to bear it in mind that even if all the present EEC legislation was abolished, marketing would continue and most producers in Europe would continue to grade, though they might grade differently. The alternatives are not chaos or the present system, but the present system or a somewhat different system.

It should not be thought that, because it is generally agreed that some form of grading is desirable, we should assume that the system adopted by the EEC is desirable. On the contrary, there are hundreds of possible grading systems, and many of them would be positively harmful to producers and consumers. It has been the aim of this report to identify the harmful aspects of the present system and the aspects that are of little or no practical value.

This report aims at identifying the defects of the existing system so that the defects can be removed and the system improved. It would be wrong to devote most of the report to the benefits obtained from the

system and to gloss over the defects in order to produce a “balanced” report: this would ensure that nothing was done to remedy the defects.

An Alternative System

This report contains strong criticisms of much of the EEC legislation; it refutes the arguments put forward to justify many aspects of the system and it shows that there is no practical or theoretical justification for the standards or the system. It is not necessary nor desirable that anyone criticizing such a system should define the best alternative - indeed this study shows the importance of basing any grading system on detailed research into the preferences, purchasing patterns, handling and search costs of consumers and distributors and on the production, handling and sorting costs of producers in the different EEC countries, research which has not yet been carried out.

However it may help the reader if one alternative system which is clearly cheaper, more practical and more effective than the existing system, but which retains its more valuable aspects, is described. The alternative described is only one of many possible alternatives and better alternatives do exist. However, the attack on the present system does not depend in any way on the existence of this alternative and is not compromised by any weaknesses in the alternative suggested.

Under this system: -

1. It should not be compulsory to label produce with the EEC grades at retail. If the retailer chooses to use the grades he should, of course, be required to use them correctly.
2. There should be no compulsory minimum standards. Producers, wholesalers and retailers should be permitted to market produce that does not reach present EEC minimum standards provided it is marked Class IV.
3. Producers, wholesalers and retailers should not be compelled to use the present grading system. If they are supplying a specialized market, they should be able to use their own brand or a designation such as Grade A instead. If they do use the EEC grades, the labelling should be correct, and conformity to the grades should be enforced legally.
4. Market research investigations should be carried out to find out what buyers' preferences are. EEC grade specifications should vary over time and from country to country and as there is a large number of crops to be covered these experiments should be continuous. This does not imply frequent changes in specifications to conform to seasonal changes in demand. Specifications may change over a five to ten year period.
5. National governments should consult with producers and economists to identify those products, which will benefit most from quality control. They should then concentrate their efforts on these products. Enforcement and utilization of the grading system would then be far better both because producers would be willing to co-

operate where they had asked for the grading system (as with marketing orders in the United States) and because grading inspectors would be concentrating on a few products at primary wholesale level instead of on 27 fruits and vegetables (and possibly on flowers as well) at all levels.

6. Instead of forcing grading on retailers, governments should train them in modern management techniques. Most poor quality at retail is due to inefficient management at wholesale and retail. Retailers can be expected to respond more to being taught how to increase their profits than to being ordered to conform to EEC grading regulations

7. Whenever possible, reforms should be achieved by improving the physical facilities for harvesting, storing, sorting, packing and transport, by introducing better packages and by introducing modern marketing techniques. EEC regulations, at best, have only an indirect and unselective effect.

ECONOMIC THEORY

An attempt has been made to keep the economic theory in this appraisal as unobtrusive as possible, so that the non-specialist economist can read it easily. There is, nevertheless, a high theoretical content and, though formal proofs of all the results are not given, they may be found in the literature cited. Some points that are obvious to an economist are treated in detail: this is because it has been found that non-economists are very confused about them. Some points that have been treated as self-evident are, no doubt, not clear to the non-specialist economist. It is not, of course, possible to give a full explanation here of all points that might conceivably not be clear to all readers, but I shall be pleased to answer any queries or criticisms, explaining the logic more fully.¹

An unusual feature of the economics of grading is that there is remarkably little difference of opinion between economists and that practical and theoretical economists tend towards the same conclusions. This appraisal of the EEC fruit and vegetable grading system is very critical of it in concept and execution but most of the criticisms are to be found in economic appraisals of other grading systems. Indeed, one can only wonder how anyone who had read reports such as those of Waugh (2), Mehren (3), Erdman (4) and Nybrotten (5) could have arrived at the EEC grading system. An exhaustive bibliography on the economics of grading (1) quotes over 300 publications, of which only four papers, and these having little or no theoretical or empirical content, could be taken to give any support to the EEC policy or grading. The results of this study will not therefore come as any surprise to economists.

The economic framework used in this analysis is the one set out by Bowbrick (6). This embraces information economics, abstract theoretical models of grading and the analyses of practical economists like Waugh (2) Mehren (3) and Erdman (4). The most important aspects of grading in this framework are segmentation, sorting and information.

With segmentation, it is accepted that the demand for quality is not the same in each segment of the market. By changing sorting and distribution, the seller can see that the quality offered to each segment of the market matches its demand. This means that the seller gets a higher return and the buyers get greater

¹ Since this was published, a complete, integrated and coherent basis for the economics has been published: Peter Bowbrick, **The Economics of Quality, Grades and Brands**, Routledge, London 1992. The literature on the subject has grown, but I am not aware of anything that would alter the conclusions presented here.

satisfaction than they would if a given consignment of the product was not sorted and there was no segmentation.

In the fruit and vegetable market there is a range of quality within any grade and the value of segmentation or of information on quality depends on the dispersion of quality within the grade. The sorting strategy and sorting methods adopted largely determine this.

In principle, grades can be used to reduce search costs in several ways. If produce is labelled, buyers can rapidly find the quality they want or, more important, pass by the grades they do not want without even a cursory inspection. Customers can buy on description. Grades can be used for price reporting, so enabling both buyer and seller to make a more informed decision. Even if produce is not labelled, the customers' search is reduced just by the knowledge that the product has been sorted to some unknown specifications.

A major finding of economic theory is that any change in grading specifications changes all supply and demand functions, for the product, for the grades and for individual items. One cannot use *ex ante* data, however complete, to describe what will be the effect of introducing a grading scheme throughout a market: any prediction will be a guess. Still less can one predict the effect of introducing a grading system for several competing fruits and vegetables simultaneously.

One can design a grading system that will be better than no grading at all for either most producers or most distributors or most consumers but an enormous effort is necessary to say that one grading system is better than another. In any real market it is very difficult to design a system that will be better for all producers or all distributors or all consumers. It is virtually impossible that a system will benefit all producers, distributors and consumers. There is no theoretical reason to believe a priori that the benefits outweigh the costs.

While it must be accepted that economic theory is at present incapable of defining an optimum grading system, it is quite adequate for pointing out some of the more obvious blunders of an existing system. Once these are remedied it will be possible in due course to approach a "second best" solution.

To the economist the question of the optimum grading system for a market is an economic problem to be treated as dispassionately, as disinterestedly and as objectively as any other. However, several economists have commented on the emotion, irrationality, obtuseness and bias that the subject can arouse in non-economists (e.g. 5, 14, 33, 34, 42). In this appraisal the aspects that have aroused most emotion are analysed, with fact and hard theory. The economic criteria and welfare criteria used are broadly accepted by economists.

Williams (14) has laid down the minimum requirements for a grading system and the requirements of an optimum system. His minimum requirements are:

1. There must be distinct, or potentially separable, demand functions for different real qualities of the product.

2. Buyers must be unable to readily and accurately distinguish among significantly large differences in basic quality attributes or differences in combinations of these attributes.
3. The grades must be related to distinct and potentially separable demand functions i.e.
 - (a) Variations in some economically important attributes can be measured, at least subjectively, and are employed in the category specification.
 - (b) The variation in these quality attributes, within at least some of the grades, is significantly smaller than the variation in the entire population of the product.
 - (c) The grading system reflects significant differences among at least some of the grades in the range of basic quality attributes.
 - (d) One might add a further requirement to those laid down by Williams, the requirement that “noise” in the form of information on irrelevant attributes, is not enough to drown the message of grading by relevant attributes.
4. As a result of grading, average (net) unit marketing costs fall or, alternatively, rise less than the additional average price consumers or other buyers are willing to pay for the product (all grades).

The optimum system would require in addition:

5. Variations in all economically important attributes can be measured precisely and all are employed as grade determining criteria in the standards. (By implication “economically important” attributes exclude those for which the buyer can readily and accurately distinguish among significantly large differences whether in the attribute itself or in combination with other attributes).
6. The within-grade variation in the level of quality attributes should be minimized relative to the variation in that grade and each of the two possible adjacent grades.
7. The standards should maximize differences among grades in the range of quality attributes, which means that overlapping has been reduced to a minimum.
8. “Any net reductions in costs are maximized or, alternatively, the value represented by the additional average price consumers or other buyers are willing to pay is positive and maximized.”
9. The system must be simple, easily and uniformly understood.
10. The grades and grading system must be fixed in the short-term, but must be adaptable to long-term changes such as changes in tastes and in marketing channels.

The problem of defining an optimum even for a simple theoretical model is considerably more difficult than Williams would suggest. Mehren (3) concludes, “With known static and independent sub - demands, criteria for optimum allocation are well known. Yet, the functions are not always or perhaps even usually known. Conceivably, commodity demands could be striated by many different grade combinations.

The criteria governing optimal specifications of grades are not known, even for the short -run.” Even this is optimistic: Lancaster (10) uses a simple model of classes to examine the socially optimal degree of product differentiation. In spite of the fact that his model is far too simple to be applied to the fruit and vegetable market, he concludes that the optimum is not easily recognized and that the direction of bias is uncertain.

It will become clear during the discussion that Williams’ criteria are not always sufficiently restrictive, because they are based on rather simple theory, and that they cannot always be applied directly to the fruit and vegetable industry. However, there is a great deal of common sense behind Williams’ criteria and it is proposed to use them as a rule of thumb in assessing the EEC grading system.

The following welfare criteria are used:

1. It is worth incurring a cost only if the benefit arising is greater than the cost.
2. An immediate benefit is to be preferred to a benefit of the same magnitude arising in the future.
3. A certain benefit is to be preferred to an uncertain benefit of the same magnitude.
4. A distant cost is to be preferred to an immediate cost of the same magnitude.
5. A cost, which is uncertain, is to be preferred to a certain cost of the same magnitude.

THE EEC GRADING SYSTEM

Under the EEC grading system for fruit and vegetables up to four grades of a product may be sold.

Class Extra is virtually never used in Ireland and is of minor importance in other countries. There is no Class Extra for lettuces, onions, spinach, peas, cabbages, sprouts, celery or peppers.

Class I exists for all crops.

Class II exists for most crops. It is illegal to sell Class II of several crops such as table grapes or strawberries (though a Class III is permitted at some times of the year) and Witloof Chicory.

Class III exists for some products. It is illegal to sell Class III or below of the following, though some seasonal relaxations are permitted: apples, oranges, mandarins, etc., lemons, table grapes, cherries, and strawberries. It is always illegal to sell Class III or below of headed cabbage, spinach, peas, beans, carrots, garlic, asparagus, artichokes, celery, apricots and plums.

Out of Grade It is illegal to sell any product that does not reach Class III. For several crops it is also illegal to sell Class II, or Class III. Sometimes a Class III has been defined in the regulations but it is not permitted to sell it: sometimes it has not been defined but it is illegal to sell anything below Class I or Class II.

Only about one quarter of the products covered by the regulations have all four grades. This means some Class II and a lot of Class III must be dumped as well as all the Out of Grade produce.

A list of the relevant regulations is to be found in the bibliography (49 - 109).

THE AIMS OF THE EEC GRADING SYSTEM

The reasons for introducing the EEC grading system and the reasons for keeping it in being should be clearly stated. However, I have not been able to find any statement, official or unofficial, of the aims of the system, still less a statement of how it is intended to achieve these aims. Individuals have made statements from which aims could be inferred, but most of these aims are self -contradictory, or incompatible with the regulations. A typical statement, made by an influential British prepacker welcoming the proposed introduction of the EEC grading system was: “As I see it, we shall be able to pick and choose, and get a better grade of article. Our leakage in waste will not be as great and we shall be in better competition, offering a good article, and when the market has to pay top prices the substandard stuff will eventually disappear from the market” (120). It is an achievement to combine as many conflicting aims and begged questions in two sentences.

I propose here merely to state as clearly as possible the aims as they can be derived from various public and private statements. In later chapters I discuss whether the EEC grading system does in fact, go any way towards meeting these aims.

A. To reduce the price to the consumer

1. Improved information means less search and risk for the consumer and so, in effect, a lower price. If all produce in shops is labelled, search will be reduced.
2. Improved sorting will mean that there is less variation within a display, enabling the consumer to find her optimum choice with less search cost, for instance by enabling her to ask the retailer for 1 kg of tomatoes instead of having to select the tomatoes one by one.
3. Reducing risk and search by forbidding the sale of any produce that has more than a certain percentage that does not meet a certain minimum standard.
4. Reducing the confusion that arises when there are several parallel grading systems and a multiplicity of brands.
5. The grading system will allocate supplies more efficiently, so that different segments of the market get the grades they prefer, and as a result consumer surplus is increased.
6. The EEC grading system will stabilize supplies by selective use of minimum standards legislation and so increase consumer surplus.
7. Reducing distribution costs and so reducing retail price.

B. To improve the quality bought by the consumer

1. Preventing the sale of any product that does not meet certain minimum standards.
2. Allocating the supplies more efficiently so different segments get the quality they prefer.
3. Ensuring that the product is sorted so a more uniform and, by implication, better product is offered to the consumer.

C. Increasing Distributors' Profits

1. Reducing retailers' procurement costs
 - (a) by permitting buying on description
 - (b) by improving price reporting
 - (c) by reducing the necessity for inspection.
2. Permitting more accurate segmentation, with each retailer buying only the quality he wants.
3. Reducing waste, as the retailer buys only the quality he wants (i.e. only a limited proportion is out of grade).
4. Reducing the display space and floor space required as search time is reduced and each customer spends less time in the fruit and vegetable department.
5. Permitting the retailer (or wholesaler) to get the profits of segmentation by selling each group of customers (or shops.) only the qualities they require.
6. Reducing supply by minimum standards and so increasing the price charged, (but also the price they pay).
7. Reducing fluctuations in supply by selective use of minimum standards legislation and so reducing handling costs and the price fluctuations that upset customers.

D. Increasing producers' profits

1. Reducing supply by minimum standards will increase the average price and possibly the return.
2. Improved segmentation will increase the total return.
3. Improved price reporting will permit more efficient selling and, therefore, higher prices.
4. Preventing retailers from mixing two grades together. This is frequently stated as an aim of the system. I am unable to see why; nor have I ever seen retailers mixing grades; I have no reason to believe that it would

benefit them to do so. It is most unlikely that it would harm producers if they did.

D. Administrative Convenience

The EEC grading regulations make it easier to administer certain other aspects of EEC policy, notably intervention and import controls.

The regulations can be used as an effective extension aid, forcing the growers to use those techniques that produce fruit and vegetables of above the minimum standards if they are to stay in business at all.

Contradictory Aims

Many of these aims are contradictory. Improved quality will only be achieved at the expense of increased segmentation. One cannot expect that consumers, producers and distributors will all get a better price. One cannot aim at increased segmentation and at a smaller number of grades and brands at the same time. The type of grading system and the specifications required to improve consumers' choice is not the best for retailers' procurement systems or for price reporting. It will be shown in the chapters that follow that many of the aims expressed are incompatible with the EEC grading system both in its design and in the specifications of the individual grades.

Even if it was possible to derive a set of aims, which did not contradict one another, and it was shown that the system did achieve these objectives, one could not be sure that the system would not conflict with other, more important objectives. For instance nearly all of the aims set out above turn out on analysis to be in conflict with one or more of the aims of the common agricultural policy, laid down in Article 39 of the Treaty of Rome:

Article 39

1. The objectives of the common agricultural policy shall be:

(a) to increase agricultural productivity by promoting technical progress and by ensuring the rational development of agricultural production and the optimum utilization of the factors of production, in particular labour;

(b) agricultural community, in particular by increasing the individual earnings of persons engaged in agriculture;

(c) to stabilize markets;

(d) to assure the availability of supplies;

(e) to ensure that supplies reach consumers at reasonable prices.

Much of the confusion about compulsory grading arises from the fact that its advocates have not clarified their aims or how the EEC grading system could help achieve these aims. If the discussion can be confined to those aims that are widely accepted, and that are in fact served by the system, there will only be perhaps a handful of aims. It then remains to be seen whether the very large costs of the system are justified by its benefits. One could not justify the system if the only aim that remained was to facilitate the administration of intervention.

SALE ON DESCRIPTION

One of the minimum requirements of a successful grading system is that “Buyers must be unable to readily and accurately distinguish among significantly large differences in basic quality attributes or differences in combinations of these attributes” (14). Where the customer can see the product and judge the quality for herself, she is not helped by any grade labelling, and it will be shown below that there are valid reasons why she should not believe the labels.

The consumer can make her optimal selection where she is offered a wide range of qualities and she can select the items that suit her best. If the product is sorted into grades she necessarily has a smaller choice. This reduces her utility in three ways. First there is a greater probability that in any shop she will not be able to buy that quality that gives her the greatest utility (few shops sell more than one grade of a product). If she visits several shops looking for the optimum quality, she incurs a serious search cost.

A second loss in welfare comes in the reduction in information given to the consumer. Instead of inspecting the product and observing its characteristics the consumer has to rely on the grade label, which gives very little information on characteristics. There may well be compensations in the form of reduced information load and more rapid decision-making, and for some goods these far outweigh the costs from loss in information. The fact that consumers continue to inspect produce even when it is labelled indicates that they do not think that the benefits outweigh the costs of reduced information.

A third loss in welfare is that discussed by Southey (131). Consumers value freedom of choice, and a loss in welfare is incurred if this is taken away. Even if the consumer is offered exactly the quality she wants, she suffers a loss of welfare, because she does not have the freedom to choose otherwise.

Consumers can benefit from grading because of a reduction in search costs, and it is conceivable that some such reduction would occur even when they inspect before purchase (see 219). For example they might know that a certain shop always sells Class II and that its price is competitive, so they can walk into the shop and take the nearest cauliflower after examining it, secure in the knowledge that the quality of any cauliflower in the display will be almost identical and it is not necessary to examine all. They might save a minute of each shopping trip, by not having to inspect. This is most unlikely to be possible in practice: it takes much the same time to assess a cauliflower for size and attributes not covered by the standard as for grade alone; grading standards are unlikely to correspond exactly to the demand specifications of any substantial group of the population much less to all individuals; a reduced choice within one shop implies greater differences between shops and, therefore, larger search costs; customers cannot rely on labelled grades because of tolerances, mislabelling, etc. These factors are discussed in detail in later chapters.

Williams (156) states “Grading, inevitably, is a compromise between the increased utility associated with making buying and selling decisions, in markets of reasonably few and reasonably well standardized products, and social gains associated with greater product variety.”

In order to justify a grading system one must show that the improvements in marketing more than compensate for these reduced benefits to the consumer - higher prices, less freedom and a sub-optimal choice.

At consumer level there can be little doubt that fruit and vegetables are bought on inspection. The grade labels give no useful information to the housewife.

One of the minimum criteria for a grading system is that there should be some distinct and potentially separable demand functions. The grade should provide some effective expression of these distinct demand functions (5, 10, 14, 6). Williams (14) suggests that the optimal grade standards should provide the best basis possible for separating the demand function. This assumes that variations in all economically important attributes can be measured precisely and all are employed in the consumer evaluation process in the same way as in the specifications. For each grade the within -grade variation in quality attributes should be minimized in relation to the variation in that grade and each of the adjacent grades. The differences between grades should be maximized. The consumer choice process is even more complex than this would suggest. Other points that should be considered in considerably more detail are the weighting that consumers give to the different attributes and the method of combining these attributes. These are discussed in (6). The optimal specifications for a given grade depend on many factors, on the structure of the market, market requirements, the number of grades and the existence of a minimum standard, for instance, and it is not possible to derive the optimum system until these constraints have been identified.

It is often convenient to talk of “better” and “worse” qualities, and it is true that one can sometimes say that if there were no difference in price nearly all consumers would prefer one quality to another: it should constantly be borne in mind though that many choices are not between “better” or “worse” but

between products that are just “different”. Abbott (129) distinguishes three types of quality variation. “Vertical” quality variation exists where nearly all consumers agree on the ranking of the qualities of the product and would make the same choice if the price were the same. “Horizontal” variation occurs where different people have different ranking orders, some preferring Alphonse Lavallee, some preferring Muscat d’Hamburg for instance. “Innovational” variation might include the introduction of a new variety, which is judged superior by most consumers. He castigates the early economists who assumed, for ease in model building, that all quality variations were vertical. Most of the quality attributes of fruit and vegetables are horizontal, over a range of levels, so even though some of the most important attributes are vertical, product quality - the quality of apples for instance - is “horizontal” over most of the commercially important range. Obviously some apples will be given a poor score by everyone and some will be given a relatively high score, so, to this extent, quality is “vertical”. Wright (130) shows that even when each of the quality attributes of a product is “vertical”, consumers with different choice strategies will have different rankings for items of that product, so product quality must be treated as horizontal. This is enlarged upon in Appendix 1 and (6).

This means that, when looking for grade specifications that will separate demand functions, we should not be trying to produce a “better” grade and a “worse” grade, but to produce a grade that appeals to a large segment of the market. If two grades are drawn up so each appeals to half the market, they may each get the same price and this price may be higher than the price for the unsorted product. Talking of “better” quality does tend to lead to value judgments.

THE CONSUMER'S CHOICE

There can be no justification for legislation requiring that fruit and vegetables should be labelled at retail unless it can be shown that a significant number of customers do in fact use the information, that it reduces search or risk, or that it makes a significant impact on price or quality. Even if this can be shown, one must ask if different information would not be more helpful.

Customers may treat a good as a search good, examining alternative purchases before deciding which is best value for money. This is an expensive and time consuming strategy and is normally limited to expensive goods, goods which account for a high proportion of expenditure, goods which have a high risk of being substandard, goods for which the disutility of substandard goods is high and goods which are cheap to inspect. Generally, however, customers buy a product on limited information and evaluate it by consuming it. This is most common for cheap goods, low risk goods and goods that are hard to inspect (6, 44, 45, 46, 47, 187, 188, 189).

Buyers adopt habitual purchase strategies for most goods. Rather than inspecting each item and making an economically optimal decision every time they enter a shop, they compare various shops, and then select the one offering the best value for money for their regular shopping trip, though they occasionally go to other shops, just in case these are now offering best value for money. They may, equally, decide to buy a certain brand or quality of good, believing that, more often than not, it offers good value for money. Whether a good is a search good or an experience good, if it is bought as part of a habitual strategy the consumer is using a lot more information than just the price and expected quality of the product on offer.

Generally housewives adopt a habitual purchase strategy for fruit and vegetables. They buy from the same retailer each week or, more commonly perhaps, they buy from a greengrocer at the beginning of the week and from a supermarket when doing the main grocery shop at the end of the week. A housewife's choice of shop is likely to be determined by one of the following: -

- a) her belief that the shop offers good value for money, allowing for price and quality, for the basket of goods she buys in that shop.
- b) her belief that the shop offers good value for money for the basket of fruit and vegetables she buys in that shop.
- c) her belief that the shop is convenient (close to home for top-up shopping, and with good parking for weekend shopping).

d) her belief that the shop will generally provide her with an acceptable quality.

Once the housewife is in a shop, she is offered a limited range - generally only one line of each fruit and vegetable, or, at most, two very different qualities of one fruit - e.g. small prepacked apples and large loose ones. She has the alternatives of buying the quality cabbage that is available to her, of going to another shop, of postponing her purchase or of buying something else. Going to another shop for a few items is inconvenient, and it is always possible that the second shop will offer an even worse bargain and she may find that the original offer is no longer available when she returns to the first shop (6, 44, 45, 48, 221, 222). Because of this search cost, she will be willing to consider otherwise unacceptable purchases rather than change shops as the retailer has a considerable locational monopoly once she has entered the shop.

The main decision is which of the goods on offer in the shop to buy. One strategy is to say "This shop is the cheapest for my market basket so I shall buy what I want, knowing that the good bargains will outweigh the bad". With this strategy information on quality is not used. Another strategy is to attempt to buy the optimum mix from what is available. This is really a search strategy. More commonly a housewife would avoid what are obviously bad bargains. In this case information on quality could shift sales from one line to another within a shop.

The buyer may, quite rationally, reduce search further by ordering by telephone 3 kg potatoes, 1 kg tomatoes, 6 oranges etc., without specifying quality, and changing the supplier if she does not get good value for money.

The housewife expects that any shop will offer some good bargains and some bad ones, so the decision to change shops will not be based on the fact that poor bargains are offered in one or even several lines and possibly not if everything on offer on one day is poor value for money. The decision is likely to be based on consistent dissatisfaction with her purchases coupled with the fact that her check purchases elsewhere have revealed that another shop offers better value for money. The information may be obtained by comparison of price and quality in the two shops, but it is at least as likely to have been obtained from other quality cues, such as the opinion of friends, or from the family's assessment of quality when eating the food.

Sometimes housewives treat fruit and vegetables as a pure search good, comparing price and quality until they find the best value for money, whether for one line or for a market basket. This is most likely to happen in a retail market, where information is cheap, or in a strange shopping centre where they cannot rely on experience or other quality cues.

Information Available

If the consumer can use information to make an equally satisfactory purchase with less search or risk, the information, in effect, makes the product cheaper. Many different sources of information are used. Market

research shows that housewives use a range of quality cues to judge the quality of a potential purchase. She takes into account the price (expecting more expensive goods to be better), her experience of other goods with a similar label, her experience of other goods from the same shop, the reputation of the shop, the location of the shop, its cleanliness, and similar factors. In fact, it is very seldom indeed that a housewife judges the quality of a product by the label alone. It follows that any grading system designed on the assumption that the grade label is the only source of information will be inefficient. An effective labelling system would have to complement this information system instead of duplicating it. A system, which gives specific information on one or two attributes, is likely to be of more value to the consumer in making her decision than one, which merely gives a general indication of level of quality. (Note though that a completely different design of grades will be needed if the system is to be used mainly for other purposes, like price reporting.) -

With fruit and vegetables inspection is so easy that the label is superfluous. The housewife will look at the produce before she buys, whether or not she has seen the label. Even a cursory glance is enough to tell her what she wants to know. She can observe all the factors that the sorters in the packhouse can. She can assess all the factors relevant to her because, after all, it is her utility function that matters. Retailers in Ireland believe that customers ignore the grade labels, so they mark everything, however good, as Class II (128, 135, 136). They then do not have to worry about its being marked down by inspectors. This is also done in the Netherlands with apples, for instance, (139) and it is common in Britain.

One must ask therefore what information the housewife requires to make a more rational choice. It is pointless to give her information that is readily available to her. Southworth comments “grades for apples, potatoes and tomatoes have nothing to do with either eating quality or wholesomeness. Sure there may be a higher yield in the kitchen from the higher-grade product but I doubt if the housewife needs such a qualitative evaluation. She’s pretty sharp herself on this score” (132). A buyer for a large supermarket chain agreed “A government grade or packer label would not mean much on a display of fresh tomatoes or pod peas. The homemaker can usually see at a glance whether the product appeals to her and probably no grade tag would lead her to think the product was either better or worse.” (133).

The assumption that the housewife cannot use her eyes leads to ridiculous regulations. For example, cucumbers that are crooked must be marked down to Class II even if they are perfect, and most crooked cucumbers end up in Class III (53, 61). If a consumer does not notice that a cucumber is crooked when she sees it in the shop, she is unlikely to notice that it is crooked when she takes it home. People who see crooked cucumbers marked Class II and straight ones marked Class Extra might reasonably assume that the crooked ones taste worse and the demand function would be changed by a ridiculous regulation. The provision might well be justified in the regulation were to apply only at wholesale, but even so the label “Class Extra: Crooked” would be much more accurate and informative.

Some information apart from the grade could be helpful. For some products, information apart from the grade must be marked, such as the nature of the good (where it is not easily seen) the variety or cultivar,

the district of origin or national, regional or local trade name. The value of this information varies from product to product. The name of the variety or product is irrelevant for most consumers - few horticulturists would claim to be able to appreciate the relative merits of different varieties of beans, carrots, artichokes, grapes, garlic, oranges and lemons. For some products like apples, the variety is extremely important and labelling may tell the customer something she wants to know, so it is good commercial practice to tell the consumer. The country of origin, again, does not appear to tell the customer anything of value in most cases. Customers in producing areas like to buy local produce, believing it to be fresh, but customers in the large consuming centres do not have the same interest in the region of origin (29). Country of origin may be used as a brand name, in which case it is often in the retailer's own interest to use it. The value of this information to the buyer in her decision-making can only be determined by experiment.

It would be helpful for the consumer to have details of defects that are not obvious on inspection. Usually the defect is hidden equally from the producer and from the distributor. The large supermarkets, which use destructive testing as part of their quality control, might be able to spot doubtful consignments, but this quality control system is outside the scope of the EEC grading system. It is definitely in the retailer's interest to replace goods or refund the money without argument if a consumer complains, and most do this. If there are hidden defects, therefore, the EEC grading system will not protect the customer, and anyway she usually can get compensation from the seller without difficulty. As the British Consumers' Association found, "Grading for condition does not tell you very much about what the fruit and vegetables will be like to eat. It's concerned about how it looks, its colour, whether it's got bruising or other scars or been pecked by birds or even eaten by worms. But you can't really tell from this grading whether, say, an apple that's meant to be crisp will be woolly inside", (sic.) (113).

While consumers may, or may not, think that it is 'Good Thing' to mark produce with the grade, they often do not use the information they have demanded. In the United States, where detailed labelling of many foods is required, it has been found that "consumers like and support the information labels more than they use them" (14). In fact, direct use of this information in the purchase decision was low: "Consumer support of the programme came primarily from perceived benefits that are apparently unrelated to direct use" (140). The information given, unlike that given by a vegetable grade, was precise, and referred to nutrition and so could not be acquired by a cursory inspection. It would be unwise to infer from this that the information is not required: it is possible that they use it in the search period but not after they have derived a habitual purchase strategy (6).

One may wonder whether grade labels perform any function at all at retail. Certainly it is possible, if unusual, for a customer to have a satisfactory habitual purchase strategy, which does not make use of inspection or grade description. In general a housewife who gives a cursory glance to see the attributes not covered by the grade will see the grade as well. It must be concluded that the EEC grading standards do not meet the accepted minimum requirements for a grading system and should not be applied at retail. Much of what has been said here applies equally to purchases by retailers or wholesalers, but the use they make of

grades cannot really be discussed except in the context of their marketing system and it will be covered in a later chapter.

Variation of Quality Within the Grade

If the grade designation has a precise meaning, it can be used when buying on description. The less precise its meaning is, the more likely it is that customers will want to or have to inspect the product to see what the quality is (6). Williams' criteria for a grading system (14, 29) require, as a minimum, that the variation in some economically important attributes in at least some of the grades should be significantly smaller than the variation in the entire population of the product. Ideally the standards should maximize differences among grades in the range of quality attributes, which means that overlapping has been reduced to a minimum. How far do the fruit and vegetable standards go towards meeting these criteria?

The range of quality permitted within a single grade is so great that the standards certainly do not "maximize differences among grades in the range of quality attributes". Class Extra is rarely used and Class II and Class III do not exist for all products. This means that for most products there are only two effective grades, Class I and Class II.

Two grades give only a very crude separation. The more grades there are, the smaller will be the variance within grades and the greater will be the variance between grades. If there were more grades and these were more closely related to the requirements of particular subgroups, the grades would be of much more value. It is significant that in the world commodity markets, where grades play a very important role, there are a large number of grades; there are 119 commercially meaningful grades of tobacco in one subsection of one small market, the Zimbabwean Virginia, flue -cured tobacco market (144). This number of grades is only really necessary when a product is bought on description from a foreign country (6). Five or six grades plus information on relevant attributes should give sufficient definition for fruit and vegetables.

Overlapping has not been "reduced to a minimum". A single grade covers a wide range of qualities. A Class II may be a consignment that barely escaped being dumped by the full use of permitted tolerances, or it may be a Class Extra, except that it exceeded the tolerances in one respect.

To add to the confusion, the attribute on which the product has been downgraded may have been of no economic importance. For instance, a cauliflower may have been downgraded because it did not reach the minimum size specified. In fact, when customers evaluate a multiple -attribute product, each will have a different way of evaluating the attributes or of weighting them. When customers are ranking cauliflowers in order of preference, the decision at the margin may depend on different factors. One customer may prefer Cauliflower A because it is whiter: another may prefer Cauliflower B because its curd is tighter. At the margin, then, many of the attributes included in the specification and the attribute, which determined into which grade a product should go, are necessarily irrelevant to most customers. See Bowbrick (6) for a fuller

discussion of this. It is probable, therefore, that an item will have been allocated to a grade on the basis of an attribute that is irrelevant or of little relevance to the customer, so overlapping will be the norm.

Even if the grades were fully enforced and accurately applied they would provide inadequate definition to be useful for buying on description.

Mislabelling

The value of labels to the consumer in decision-making is even further reduced if a high proportion of the labels are incorrect. This has been found to be so in Britain (147, 113) and Ireland (128, 135, 136, 148, 149, 151).

One report (147) showed that only 48 per cent of Cox on display was marked with a grade and only 5 per cent were correctly labelled. 43 per cent of Bramleys were marked with a grade and 6 per cent were correctly marked. 21 per cent of imported Golden Delicious was marked but none were correctly marked. Much of the produce had been Glass III when it left the farm, but some bruising damage was recent.

The Consumers Association (113) found that “of the 338 shops, supermarkets and market stalls visited throughout the UK, not one was labelling properly all the fruit it should. And less than a third had even one thing properly labelled”. Kohls (111) quotes US studies showing that grades are not more reliable there.

The mislabelling is not due to a conspiracy by retailers and is not necessarily due to their inefficiency. One example that has been mentioned is the policy of marking everything Class II in the belief that labelling does not affect sales one way or the other. Some studies (113, 152) show that many retailers know nothing about EEC regulations are not interested in them: they either use no labels or use them at random. The retailer does not benefit, but the inaccuracy of the labels means that customers get very little information from them. This is a case where the interest of the public and, possibly, the interest of the retail trade as a whole is not the same as that of individual retailers, and changes in legislation would be justified. However, distributors find that, with a rapidly deteriorating product, they can only avoid overstating grade by checking the labels every two or three hours. Undoubtedly, therefore, any changes in the EEC regulations to prevent retailers from understating quality would be unworkable.

It can be argued that some retailers have an interest in seeing that labels are not used, though this is an esoteric argument that I have not heard from retailers. Consumers use the labels only in the first stage of search to decide whether it is worth inspecting a display or not. Often the major benefit of a label goes not to the customers who are attracted by it but to those who decide from it that the produce is too expensive or of too low quality to be worth looking at: it serves mainly to drive customers away. Retailers know that once they have attracted the customers into the shop and have started them looking through the display, they have a considerable locational advantage; customers will take a bad bargain rather than go elsewhere, even to the

shop next door. Some retailers find that labels attract more customers than they lose. While this argument, again, could justify legislation, one would have to know whether or not customers did use the labels in this way - I doubt whether it is important - and whether the added benefit would justify the cost.

This aside, with fruit and vegetables the retailer has no vested interest in misleading the customer. He cannot conceal information about dangerous additives, as might be done with processed foods. Misleading customers about variety can pay, but the only example that springs to mind is the practice of labelling dark green French Golden Delicious as “Granny Smith” (13). Even this is becoming less common as the French advertising campaign takes effect. If the French Golden Delicious were markedly inferior to the Granny Smith, there would be a falling off in demand for Granny Smith, but this would harm the retailer. It might pay a retailer in the short run to pass off good imported tomatoes as “local”. However, greengrocery is a competitive business and since retailers rely on customers returning week after week, any malpractice, which leaves a customer dissatisfied, can lose the retailer a lot of business. If produce is obviously mislabelled, Class III marked Class I, for instance, consumers think that the retailer is trying to cheat them and this can reduce the retailer’s profits considerably. Mislabelling of this sort is, of course, covered far more effectively by the normal consumer protection legislation.

Labelling is very important to the retailer, especially the retailer who sells by self-service or self-selection. If the goods are not priced sales will be slow. If they are labelled with the price and the nature of the good “Oranges 6p each” sales will be higher. For some products further information is helpful. Sales may increase if the variety of apple is given for instance. It is in the commercial interest of the retailer to give the customer all the information she requires. She does not require an indication of the EEC grade. Labelling is a form of advertising. Good, descriptive labelling can increase sales. Some information does not increase sales as consumers ignore it, and this information is likely to take away from the impact of the information or wording that does sell.

Inattention

Studies of retailers at work show that poor labelling is generally due to inattention. Assistants are working at a hectic pace throughout the day filling shelves, and whenever the workload slackens they are called away to help at the checkout or they take their lunch break. Assistants do not make the time to prepare the labels before filling shelves. It is very easy to leave old labels on display at the beginning of the week, or when new lines are introduced, instead of changing them to give the grade of the now produce, (135, 136). This problem is serious enough with price labelling, even though retailers realize that it is essential, and incorrect labelling is punishable at law. Grade labelling is not considered as important, so is very much less accurate.

Retailers, particularly those who are not specialist greengrocers, frequently assume that if they buy a box of Class I apples they are entitled to sell all the apples as Class I. In fact the box may have been wrongly

labelled or the quality may have deteriorated before the box entered the shop.

Another reason for mislabelling arises because it was not realized that the specifications required for grades at wholesale were not suitable for retail grades. There is a clear theoretical and practical distinction between the two. For example, a box of Class I apples may produce many packages which do not meet Class I standards. This happens because a box may legally be classified as Class I if up to 10% of the contents do not meet Class I standard. If the apples are put into Bags containing nine apples or fewer, any package containing one substandard apple will exceed the tolerances and will be Class II. -Between 11% and 89% of the packages from the Class I consignment will be Class II for this reason (19, 6).

If a box of cauliflowers has one Class II cauliflower it may still be classified as Class I. On display the Class I will sell first, (if the consumer prefers Class I), and the Class II will remain. The display will then be replenished from another box. By the time 48 cauliflowers have been sold, four or five of the cauliflowers on display will be Class II, and the display will be Class II, instead of Class I. Of course, the retailer can get over this by constantly policing the display, by removing the Class II and dumping them, by selling them off cheaply, or by changing the label. This would add to the labour costs and might not be very effective (136).

Informal Derogations

Another major reason for misleading labelling is government policy. There are derogations from the quality standards, usually unofficial and illegal derogations by member states in times of scarcity. The main objections to this are discussed fully in the chapter on stabilization, but the effect on the accuracy of labelling is discussed here.

If there is an acute shortage of cabbage, the grading inspectors will permit Class III to be sold. Burst, underweight or heavily trimmed cabbages are permitted. Similar derogations are permitted with most products. It is felt by governments that if EEC regulations were to be strictly enforced there would be acute shortages from time to time and it would be politically unacceptable to have extremely high prices when Class III was being dumped. Where Class Extra, Class I and Class II are permitted by law, and there are official or unofficial derogations, Class II varies in meaning from "Nearly Class I" to "bottom of Class III", or even "Out of Grade" depending on the supply situation. Only Class Extra and Class I continue to mean the same, though even here one suspects that Class I comes to mean "the best of what is available". Grades lose most of their information value if they vary in meaning from week to week in this way.

Further confusion is caused by the fact that some standards are rigorously enforced at a time when the standards for other crops are relaxed to the point of disappearing. There may be a very strict standard for top fruit at a time when there is an acute shortage of cabbage and cauliflower and all qualities of these are

acceptable on the market. While one does not expect customers to compare apple and cauliflower grades directly, one cannot expect them to have much confidence in apple grades if cabbage standards are obviously low. One cannot justify prosecutions for mislabelling if the state itself derogates from the standards.

Remedies

As mislabelling is a hindrance to the effective use of the grades, an effort should be made to stop it. If there were no minimum standards, it would not be necessary for retailers or government to derogate from the existing standards, which would acquire more meaning (it will be shown in a later chapter that minimum standards cannot be justified). If it was not compulsory to mark grades at retail, only those retailers who felt it paid them would mark EEC grades and they would do it well. Because so few retailers would be labelling, it would be a simple matter to ensure that they were labelling accurately, and to prosecute is necessary, using appropriate legislation such as the Trades Description Act rather than EEC fruit and vegetables regulations, which are not designed to be the basis for prosecution. Probably the most effective way of improving labelling is to run management training courses which will show the retailer, among other things, that bad labelling loses money. Again, the rationalization of the grading system would be an enormous help.

We must conclude that labelling is so poor at retail that consumers would be foolish to rely on grade labels as an indication of quality. In view of the fact that the information given would be superfluous where the consumer inspects the product, and of very little importance at the margin where she buys on description and in view of the fact that the information on the grade label is not suitable for consumer decision making, it may be concluded that there is no justification whatsoever for enforcing grade labelling at retail.

MARKET DEVELOPMENT

Most Europeans are eating as much fruit and vegetables as they want and they will not increase their consumption however much their income rises or prices fall. Any important increase in the value of the market is going to come from people paying more for what they eat. This implies one or more of the following marketing strategies.

- (a) Improve the quality of the product supplied to the consumer and charge more for it. This may imply supplying better quality cabbage or supplying a more expensive fruit or vegetable instead.
- (b) Identify a segment of the market with a distinct demand function, and sort some of the product to meet the requirements of that market.
- (c) Identify a segment of the market with a distinct demand function, and change production to meet the requirements of that market.

It should be emphasized that the improvements in quality discussed here are those that the consumer is willing to pay more for and not those that are only of interest to the retailer.

A set of grades will be effective in so far as:

- (a) it increases consumer's satisfaction with the product.
- (b) it permits the seller to extract more consumers' surplus.
- (c) it reduces marketing costs.

Broadly speaking, the set that increases consumer satisfaction most will be the one that enables distributors to extract most consumers' surplus. It would, of course, be prohibitively expensive to supply a product graded to different specifications for each segment of the market but a moderate amount of segmentation could be attained at a very low cost. It is clearly cheaper and more effective for each farmer to sort his crop according to the market segment he is supplying, than it is for everyone to sort to the same EEC standards.

A single unique set of two to four grades, like the EEC grading system, cannot be optimal in increasing consumers' surplus or in increasing the total revenue of producers or distributors by segmentation. Consumer satisfaction increases as the number of grades increases, but the marginal increment in satisfaction from each additional grade falls (138). Consumers, producers and distributors are most likely to benefit when there is a large number of grades. A similar segmentation can be achieved by branding. Consumer satisfaction will increase if:

- (a) the existing product is sorted into categories, which more nearly satisfy consumer wants than the present categories.

(b) production changes so that there is more of the high -priced category and less of the low-priced category, and prices change accordingly.

The trend in modern marketing is away from the blanket uniformity that was necessary when the only aim of production was to produce as much as possible as cheaply as possible. With motor cars, for instance, the single uniform black Model T Ford suited the primitive market of the 1920's but far more variety is required to satisfy today's saturated market; within a single model, the Mustang, there were so many choices of colour, engine size, number of doors and so on that no two cars of the millions built need have been identical.

With food, in the EEC at any rate, it is no longer necessary to demand blanket uniformity as a method of producing the basic foods as cheaply as possible. Blanket uniformity reduces the market size. "The proliferation of wants and activities in our complex society, the cultivation of enhanced powers of discrimination, the desire to satisfy wants with a high degree of precision and technological advantages in the exploitation of possibilities for specialization and mass production have combined to bring our civilization to the point where it can no longer expect to reap the advantages of mass production techniques except by the dubious expedient of curtailing people's wants and activities" (3).

It is no accident that virtually every product in a modern supermarket is branded except greengrocery and meat. The logic of branding is closely akin to that of grading: the main difference being that a branded good is generally produced to a specification and is advertised, while a graded good is generally sorted from a heterogeneous mass (6). Brands provide the seller with the means of differentiating his product from his competitors' in many little ways and so fitting a niche in the market. The proliferation in the number of brands confirms that there is generally a range of consumer demands. Only in a few areas are products still sold as commodities in spite of efforts to introduce branding.

The policy of improving the quality of the produce on the market can increase the value of sales, though possibly not the volume. There has been a tendency over the past thirty years for more and more supermarkets and variety stores to aim for the top of the market, and it is possible that there has been an increased demand for top quality produce relative to the lower qualities. It is possible, though, that there has been no change in demand, and that these shops have merely attracted customers who were buying top - quality produce elsewhere or those that wanted to buy it but were not able to buy it elsewhere. There may or may not be a long-term trend towards buying higher quality. Even if demand swings towards better quality produce and producers improve their product, the total quantity sold will not change much. "Taking the long-term view, however, there is little reason for expecting the per capita consumption of Grade I to be any greater than of the ordinary potatoes they replace. Indeed it might be found that the consumption of Grade I was somewhat lower than that of ordinary due to reduced wastage" (161).

In the shorter period there is some tendency for richer people to pay more for their food. The income elasticity with respect to price paid (the difference between income elasticity with respect to expenditure and

the income elasticity with respect to quantity purchased) gives some indication of demand for quality, “in a broad sense covering the quality of food itself and the services associated with its sale, including the saving of the housewife’s time which results from shopping at the most convenient shop instead of at that charging the lowest price” (153).

Appendix 2 shows some cross-sectional income elasticities with respect to price for horticultural products. The elasticities are generally very low in relation to the standard errors and there are substantial year-to-year variations so there is a considerable margin of error. The elasticities are also generally very small; for a 1% increase in income one could expect the average price paid to increase by perhaps 0.05 per cent. One cannot, therefore, assume that wealthier people buy better quality produce, as the other explanations such as the saving in the housewife’s time in shopping in a more expensive shop could explain the difference.

Even if we could assume that the EEC grades were vertical and that all consumers would prefer Class Extra to Class I, and Class II to Class III (if the prices were the same), we could not assume that there was an unsatisfied demand for better quality. People may prefer Class I to Class III but not many are willing to pay three times the price for it. An unsatisfied demand only exists where people would be willing to pay well over the Class Extra price (it must be well over to allow for the market effect) for Class Extra but they cannot obtain it. Of course, if all retailers sell excellently sorted Class I and Class II this unsatisfied demand is no nearer being satisfied.

Even if people are willing to pay more for better quality in the short-run, and this is by no means clear from the evidence, one cannot assume that they will be willing to pay more in the long run. Over time the new improved quality will come to be seen as the norm, and the price can be expected to drop to the normal level.

The policy of identifying a segment of the population with different demand functions is more promising. It may imply changing the sorting or the production methods. For example Meulenberg (24) found that in the Netherlands auction markets, sorting Dutch cucumbers and tomatoes did not bring about effective market segmentation. He felt that segmentation was more likely to be profitable if it was possible to choose the grade before sorting i.e. to change production techniques. The market development must come from identifying special requirements of different groups, supplying a product that exactly meets their demands and charging more for it.

The EEC grades are a very blunt tool, far too blunt to segment the different market demands of even one EEC country. “First of all, in their purchases of fruit and vegetables, French consumers are far from having a simple and constant comportment. Not only does comportment vary with income level, age, socio-professional class, composition of family etc., but also the comportment of a given consumer will not be constant. At one moment he will be more concerned with quality, at another with service and at another with price” (15).

One possible way of getting sufficient definition to supply all these needs is to have a multitude of grades with one grade for each segment of the market. This would be far too cumbersome in practice: instead, in an uncontrolled market, and indeed in the EEC market, a series of parallel grading systems springs up, one for each segment of the market. These grading systems may be independent and may overlap. This does not matter. Customers will have different utility functions and different orders of preference in southern Italy and northern Scotland, so they need different grading systems. Retailers and distributors should be permitted to use whatever grading system they wish, according to the needs of their market: if, of course, they choose to use the EEC grades, they would be expected to use them accurately, and accuracy should be rigorously enforced by law.

Kuehn and Day (110) give a lucid explanation, based on Hotelling's (157) classic model, of why it could be disastrous for a producer to base his specifications on the quality demanded by the majority of the population. If two-thirds of the population prefer type A and one-third prefers type B and there are ten firms in the market supplying type A, what does a newcomer do? If he also produces type A he will have to fight hard to get one-eleventh of the market. If he produces type B he might easily take one-third of the market. An example relating to fruit would be the Golden Delicious apple. When first introduced it was seen as a premium apple by most people (29). Growers planted it instead of the other, traditional, apples. Now there is an over supply of this cultivar and growers can get premium prices for other cultivars. The fact that most people prefer Golden Delicious to other cultivars (if they still do) does not mean that only the one cultivar should be grown. It must be concluded that even if there had been extensive market research and even if it had shown that two-thirds of the population preferred a certain quality of fruit, it would have been wrong to introduce a grading system that made it difficult to provide the other third with the quality they wanted.

There are clearly major regional differences in demand between the countries of the EEC. The southern countries prefer their Golden Delicious to be golden; the northern countries prefer a sharper taste and prefer Golden Delicious that has been picked green (27). (It might be argued that this greenness constitutes a defect in colouring or even "a defect in colouring such that the fruit does not preserve its characteristics", in which case the fruit would have to be downgraded or dumped under regulation 1641/71).

In Britain and Ireland there is a demand for a very acid cooking apple and the Bramley is the favourite. As the apple is to be cooked customers are willing to accept an apple with a large number of blemishes, certainly far more than the 2.5 sq. cm. permitted for Class II, which is the normal minimum standard, or the 5 sq.cm. for Class III. The Bramley is prone to skin defects and if the regulations were enforced strictly the quantity on the market would be greatly reduced. However, in both the United Kingdom and the Republic of Ireland it is recognized that the customers are buying for flavour and cooking characteristics, and skin defects well over those permitted in the regulations are tolerated.

Similar variations in demand occur with grapes. "It is difficult to give a precise definition for the word quality". If we take flavour for example, the same table grapes can be judged as very good or very bad according to the consumer who judges and, mainly, with nationality of the consumer. Thus, a light taste, or

even table grapes without taste is something sought by German consumers though French consumers reject them. ‘Alphonse Lavalee’ is not considered a good cultivar by French producers, but it sells well when exported, which is important” (154).

The EEC regulations are not just irrelevant to anyone trying to develop a new market; they can positively inhibit market development. For example, health food enthusiasts are prepared to pay very high prices for organic foods, which have not had any artificial fertilizers or sprays. These foods, they say, are far better for them than the usual foods. Under EEC regulations it is illegal to sell any ‘organic* fruit and vegetables that are not as pretty as the ordinary ones - for example, those that have been nibbled by insects or have blotches on the skin because they were not sprayed. Here a minority of consumers have completely different preferences to the majority. It is a classic market gap, and some growers could make a lot of money by exploiting it. One could also argue that people have a right to buy those foods that they consider most healthy (27, 158, 155).

Demand varies over time as well as between countries; so most manufacturers change their specifications from time to time to meet changes in demand or to anticipate them. It is found that the market share of an existing brand drops over time as new producers enter the market and win part of the market with a slightly different product (159). The same is true of the agricultural industry: “. . . systematic variation over time in the battery of attributes called quality is obviously a major competitive device of distributors, most processors and of some farm producers.” (3): “For an agricultural industry, organized under a marketing order, to take maximum advantage of new opportunities its programmes must be flexible, responsive and subject to continuing review” (135).

The need to reassess grading specifications critically is constantly stressed by economists (e.g. 14, 142, 161). The assessment must be thorough, far more thorough than any assessment or reassessment that has yet been given to any EEC standard. A reassessment is needed every five to ten years. Most EEC fruit and vegetable standards were introduced in 1962, and they appear to have been largely based on work done in the 1940’s and early 1950’s (125). Even if they had been perfect in 1949, it is most unlikely that they would be relevant to the demand patterns of the 1980’s.

It must be concluded that the following changes should be made to EEC regulations: -

- (a) The relevance of the standards should be reassessed every 5 - 7 years and the specifications should be adjusted to meet consumers demand.
- (b) Parallel grading systems should be permitted: if someone wants to grade according to taste or nutrition or to the special requirements of the Irish market he should be permitted to do so. If he chooses to use the EEC standards he should be compelled to use them accurately.

THE RELEVANCE OF THE GRADES

If the grading system is to be of any value at all, whether for market segmentation, reducing consumer search, price reporting or improving distribution efficiency, the specifications must be relevant. The specifications appropriate for each function are different so the optimal specification for one function is sub-optimal or even irrelevant for another.

In other industries it has been argued that an otherwise admirable grading system has been ignored or abandoned simply because the specifications were not relevant to the industry. "How often have we been reminded of the unsuccessful National Mark Scheme of the '30's and of the gradual movement of commercial requirements away from the ideals implicit in the MAFF A, B, C and D grading scheme. How often have we had to reply that it was the very failure of these schemes to gain any commercial acceptance that led us first to get the classification right and then to let the grades emerge from the commercial needs of the individual traders who make up the industry" (216).

If the EEC grading specifications are irrelevant and they are used, they can reduce market efficiency. Freebairn (138) says, "In fact it might be argued that some brand names which are based on fictitious and spurious quality characteristics distort rather than increase the general level of market knowledge".

Very little research has been done on the economics of fruit and vegetable grading. I have been unable to find any theoretical model existing at the time with which the data could have been evaluated even if they had been available. Lauret (15) also comments on the paucity of work on the quality of produce and its evolution with technical changes. Folley (112) says that the main problems facing horticultural marketing economists are "our ignorance of consumers' demand and the likelihood of severe adjustment problems".

There have been some attempts at appraising the EEC grading system. Simpson (16) examined the effects of the compulsory grading of apples and pears in Britain, but had to accept that there were insufficient data. The Economic Commission for Europe (17) attempted an evaluation of the UN/EEC standard for apples and pears, but this merely involved asking civil servants if they thought the scheme was working well, and it had no empirical or theoretical content.

Other work by Meulenbergh (24), Ingersent (25), Thiault (26, 27, 28) and Tiger (29) is relevant and will be discussed later. Calabrese (145) found that existing Italian legislation is inadequate to guarantee standards of quality for citrus fruit for the home market: "the quality norms leave gaps and are inexact". He

argues that maturity norms, as used in countries like Florida and Spain, could be used instead.

The British Consumers Association report “We gave a panel of housewives 24 bowls of apples, some Class I, some Class II and some which had not been graded at all. We asked them to sort them into the different grades. Overall, they guessed right less than one time in three It’s clear from this small experiment and from what our panel told us that this grading scheme did not mean a lot to them” (113).

In Ireland a study was designed to overcome the usual problems with quality research that it is extremely difficult and expensive to determine how consumers evaluate the quality attributes in a real market, even using laboratory experiments. In a pick -it -yourself strawberry enterprise it was possible to observe what qualities people actually chose to buy. Analysis of a sample of consumers’ purchases showed that only 3 per cent of the samples picked by consumers met EEC standards. This provides some corroboration for the hypothesis that the EEC regulations are irrelevant to the consumer (22).

Mitchell and O’Neill (23) found the grade of fruit and vegetables sold by six supermarket chains was not related to consumers’ ranking of the quality of their fresh fruit and vegetables. They questioned “the ability of consumers to assess quality in this context and the stability - even over a short period - of such evaluation - and its independence from the standards they bring to bear on it and its stability over time need further clarification. This could lead to a reassessment of current grading schemes and to their improvement; as well as increasing the effectiveness of the actions both of consumer interests and those attempting to fulfil consumer demands.”

Thiault (27) believes that the EEC standards, based on criteria of interest only to the distributor, “have unfortunately come to dominate the grading system for fresh fruit and vegetables. This has led to the selection of varieties mainly on the basis of their ability to withstand transport, and has also encouraged the growers to pick their crops before they attain optimum ripeness, thus reducing their intrinsic quality, while at the same time the maximization of yields has become the main criterion of quality”. Meulenberg agrees (158). These are criticisms of the specifications of the grades and of the use made of the grade labels. If it was made clear that the specifications were for wholesale grades referring only to handling and procurement economies, and not to what the consumer calls quality, the criticisms would fall away. When retailers think that anything marked Class I will be better to eat than anything marked Class II, confusion arises.

It is easily shown that many of the grading specifications are absurd, which would confirm that market research is required. It should be remembered though that the effect of these absurdities is small compared with the combined effect of dozens of wrong, though not obviously absurd, specifications. Some absurdities are:

It is illegal to sell a stewpack, containing an onion, a parsnip and some celery, for a stew.

It is illegal to sell prepared cauliflower, with the curd cut up and packed in a punnet (49).

It is illegal to sell the specially-grown mini -cauliflowers, which would just make a meal for a single

person (57).

It is illegal to sell white cabbages or cucumbers that have been cut in two (56, 53).

It is illegal to sell the soft or low quality tomatoes that used to be sold as 'frying tomatoes'.

There is no maximum size for Class I carrots, and the virtually unsaleable 400 mm 'horse carrots' are permitted in this grade (50). The variation between the largest and the smallest carrot in the pack may be as high as 200 grams and there is no limit to the variation in bulk samples (55)

The evidence available does not support the EEC grading system and throws doubt on its relevance. However, most of the research applies to small sub-sections of the market and the results cannot be taken as being typical of the EEC market.

In the United States there has been rather more work on the subject. Waugh (2) experimented in 1928, fifty years ago, to find what attributes the Boston wholesale market valued. Several studies were published in the 1950's (e.g. 30, 31, 32) and rather fewer in the 1960's and 1970's (e.g. 33, 34, 35). Again the work done is not enough to justify a nationwide compulsory grading scheme. Dalrymple (36) suggests that "little, if any, economic analysis has been used in establishing existing produce grades, except possibly for some associated with marketing orders².... some knowledge of economics might have discouraged interest in grades for certain products". Both Dalrymple (36) and Kohls (111) give examples of cases where the U.S. grade specifications did not reflect consumer demand and where, in fact, the higher grades were given a lower rating by consumers.

The work of Eckstein, Sharon and Idan (38) and of Makov and Zusman (39) in Israel are well worth examining as applications of a high level of theory to practical problems. The problems are, however, those of getting the best price for a co-operative's crop rather than those of designing the optimum national grading system.

It has been shown that, since the EEC grading specifications were not based on a thorough study of the consumers' preferences, and indeed since there is no reason to believe that consumers preferences were taken into account at all, we have no reason to believe that they provide a good or even an adequate, separation of demand functions. There can be no doubt whatsoever that the specifications would be very much more relevant if they were based on adequate market research.

It cannot even be shown that the grades meet the minimum criterion of providing some effective expression of distinct demand functions. Evidence has been quoted which suggests that, at consumer level,

² A marketing order is a form of market control found in the United States. It is introduced at the request of producers and may include grade, size and quality regulations, rate of flow regulations and total quantity controls, research and development, advertising and the collection of market information "As consumer food prices have risen at rapid rates, public officials and consumer spokesmen have questioned whether marketing orders are in the public interest" (37). See also (33, 34).

there may be no relation between price paid and grade. If grades were intended to be horizontal this would indicate nothing, but as they are intended to be vertical it indicates that they do not reflect demand functions. In fact, it has been shown above that where consumers inspect the product before purchasing there will be a considerable degree of separation of demand functions even if there is no grading system - each customer will buy what she wants and prices paid will tend to reflect the demand. When people are willing to pay more for certain qualities but they are not willing to pay more for Class I than Class II it must be concluded that the Class specifications do not reflect consumer preferences.

Even where it can be shown that the price for Class I is higher than that for Class II it indicates only that the specifications include some factors of interest to the consumer. It does not indicate that the grading system has achieved the objective of dividing the product into categories with different demand functions, merely that it has recognized a division that would exist even in the absence of a grading system, as long as the product was inspected by customers before purchase. The grades may have no segmentation function.

The Committee System

If we are to show that the specifications used for the grading system are in any way near optimal, we need a great deal of information about consumer preferences and consumer choice processes. However, the EEC grading system and the grade specifications appear to have been based on the subjective opinions of civil servants and leading wholesalers and to have no basis in objective examination of the market. This approach has been attacked consistently by economists.

The specifications are based on what a committee thought consumers ought to want. As Brunk and Darrah (30) commented “All too frequently consumer grades are based on the opinions of technical workers concerning what consumers ought to want, rather than on actual measurements of the quality factors that are meaningful to the consumer”. Similarly Kohls (III) says, “Only differences in what users are willing to pay are pertinent to the establishment of grades. Whims and desires not backed by the willingness to pay are not justification for grade differentiation. The opinions of a few experts’ on what should be desired do not provide workable foundations for grades”.

Perhaps the most startling example of a committee drawing up grading specifications without having any facts to support them is the OECD proposal for a “General standard for products for which there are no specific standards” (213). Since this standard must apply to coconuts, yams, breadfruit, etc. it cannot have been based on any research. Normally one would expect that the EEC would in the course of time, adopt these OECD standards.

Well-intentioned horticulturists are anxious to see that consumers get the best possible product, well-grown, attractive, disease-free and unblemished. They are not trained to see the cost of their proposals and the damage they do to producer and consumer by their anxiety to “take the rubbish off the market”. Bauer

and Yamey (42) attribute this to a confusion between technical and economic efficiency.

While the views of a committee of disinterested experts, however well intentioned, are an unsound basis for a grading scheme, committees seldom consist of disinterested experts. On the contrary, the views of special interest groups are sought: it is thought that representatives of producers, distributors and, possibly, consumers should be consulted. The motives behind this are admirable, and there should probably be a lot more consultation on the aims and the administrative aspects. However, serious biases are caused if special interest groups help formulate the specifications.

Wholesalers are likely to have special interests that will conflict with those of producers and consumers. The wholesalers and retailers who are invited to join committees are atypical: for example, they usually represent large firms, as the managers of small firms cannot spare the time to attend committee meetings. Importers and representatives of producer groups, who have a vested interest in sophisticated grading and packing machinery, have an incentive to press for very tight tolerances, knowing that their competitors, the small farmers with less sophisticated equipment, will not be able to compete (5). Again, producers of certain varieties or qualities have an incentive to press for specifications that will favour their product (5, 33, 42). "If the committee members are producers of high quality fruit the quality restrictions will be higher than those that will maximize returns" (23). It is worth remembering that, because of the high transport cost, it does not usually pay to import low quality so importers will press for higher standards (18, 217).

McCarthy (217) gives an analysis of the types of harmonization that special interest groups would press for. For example, "we would expect firms selling domestically to desire the highest possible standards to be adopted as the EEC norm. This would ensure the longest possible maintenance of their price advantage." (On the assumption that national standards are lower than those for international trade, whether *de facto* or *de jure*, as is the case with fruit and vegetables).

"The demand for grades embracing narrow tolerances.... can come from agencies and institutions training personnel or having personnel already trained. To some of these agencies or institutions, research results that indicate no need for the measure may become embarrassing. It would be better that the research should be done by others." (5). An interesting variant of this is the argument "On balance, this country benefits from the C.A.P., therefore, we shall not criticize any part of it in any way". A slightly different approach is "If all EEC countries agreed to try and improve the system, all would be better off. If we are the only country that tries to improve the system, we will be expected to give a quid pro quo in future bargaining, so all other countries will be better off and we will be worse off. If we do not try to improve the system it will cost us a lot but not as much as if we are the only country to try and improve the system. Unless we are sure that all other countries will co-operate, it does not pay us to co-operate."

Consumer Surveys

An alternative method of determining consumer preferences would be to ask a sample of consumers what attributes they considered most important and to base the specifications on their stated preferences. This method is clearly superior to the committee system but, even so, economists have never considered it adequate. As long ago as 1929 Waugh said “Thus, for the great mass of agricultural commodities there has been little or no systematic research dealing with market demand for quality. What research has been done in this field has been done almost entirely by the survey method which, in general, has not been able to evaluate the relative importance of the many quality factors” (2). Brunk and Federer (32) concur.

A survey of retailers could be carried out. While this would give some indication of what retailers think they prefer to buy, it is subject to all the weaknesses of a consumer survey. The use of a retailer survey to identify what consumers prefer to buy is extremely hazardous as consumers and retailers have different perceptions of quality (139).

A survey of wholesalers would probably be even less reliable than a survey of retailers. Even if there were a well designed and conducted survey the results would probably have been incorrect. “Assuming the nature of demand from observation of the established market is a great error, because this is based on misconceptions of the trade and arbitrarily imposed standards ... The output must be submitted to the subjective valuation by consumers” (5). In other words, there is a strong possibility that wholesalers will assume that current trade practice is perfect. I have noticed too a discrepancy between what wholesalers say they do and what they actually do: as in many other industries there is a folklore. There are large and small wholesalers, some performing one of the following functions, some several: - growing, merchanting, primary wholesaling, importing, packing, commission sales, trading, secondary wholesaling, delivery and retailing: all have different interests, it is impractical to devise a weighting that gives due weight to the sectional interests allowing for turnover etc.

Specifications Based on Experiment

It is generally agreed that specifications should be based on what consumers buy rather than on what they say they would like to buy or what a committee says they ought to want to buy. This means that specifications should be based on experiment. Rhodes (218) has written an excellent review of the measurement of consumer preferences.

I have not been able to find any reference to any experiments on which the EEC standards could have been based. This is a serious lack, as United States quality research has proved valuable in many ways. For example, one research programme in the early 1950's led to the introduction of the plastic bag, showed that the quantity of apples in a bag was a key factor in determining level of sales, and showed that consumers did not see the amount of bruising on apples as being a key quality factor (30, 31, 32). This research developed a

market strategy that increased consumer returns, and showed that consumers acted in an unexpected way, ignoring bruising. One cannot, of course, assume that these USA results would apply equally to EEC countries but, if they did, they would be of critical importance to the apple industry. Because of high labour costs, EEC countries will have to switch to machine harvesting of apples in the long run if they are to remain competitive. At present, it is found that machine harvesting increases bruising and reduces the quantity going into Class I. By calling the bruised fruit Class II you may reduce the demand for it. It has been suggested above that customers ignore the description, in the short run, but one may speculate on the long-term effect of marking imported apples Class I and home produced apples Class II, in quality. Clearly, if bruising is not important to the EEC consumer it is not in the interest of the EEC apple industry to include it in the grade specifications and inappropriate standards could seriously damage the industry.

Studies that are intended to get the basic data for designing a grading system must be far more extensive and detailed and, of course, costly, than studies like the ones cited here which aim only at testing some aspects of the grading system. Even a fairly straightforward experiment, testing a set of grades defined by five attributes and with five price ratios, requires a large experiment and is probably impossible in a very small market, in a market with rapidly fluctuating prices, or for a short season crop.

Because of the work involved in drawing up grade specifications that separate demand functions, the effort is concentrated on comparing the acceptability of one grade against another, using different specifications. This is short-sighted; instead, economists should “begin testing effects of alternative systems, numbers and sets of grades on aggregate demand for the product, marketing costs, production costs, net returns producers and allocative efficiency of the marketing system.” (156). To-date this has not been done for the EEC fruit and vegetable system.

Specifications Based on Taste

It is possible to base the standard for a product destined for a clearly defined sub market on flavour and organoleptic qualities which can be measured with instruments (27) and in the next ten to twenty years this market segmentation is likely to prove important on the EEC market. This and other forms of market segmentation are discussed below. It is generally agreed though, first, that EEC standards should not be based on organoleptic qualities and, second, that EEC standards are not a good guide to taste and organoleptic qualities.

In the Hungarian National Institute for the Qualification of Agricultural Varieties a great deal of work is done on objective tests of taste and physical characteristics and on the preferences of consumers taste panels under laboratory conditions, but it is always accepted that it is what the consumer will buy that is the

final decider, that “in order to be able to pass judgment upon the consumer utility of the product concerned, it is indispensable to measure consumer preferences under actual market conditions” (121). It is possible to do thorough research on quality without considering the objective physical quality that a chemist might measure. For example, a PhD thesis, which was an extremely thorough analysis of qualitative aspects of the demand for fruit juice, was based entirely on market research techniques and had virtually no comment on the objective physical quality (122).

An EEC report (27) makes it quite clear that the present EEC grades do not reflect the organoleptic quality of the produce any more than they reflect what consumers prefer to buy. Some of the criteria are of course important for some product lines: among those cited are cleanliness, freshness of appearance (for salad vegetables) and size (within a cultivar). However, “In the common standards, the various types of divergence from the norm are listed as ‘defects’, and some of these are quite incompatible with the standards of superior gustatory quality; but in other cases there is no connection between the two sets of parameters, and the so-called defects may indeed be more frequent precisely when the cultural and climatic conditions are most conducive to the production of top quality fruit and vegetables” (27).

Examples quoted include: “skin defects which have no effect on quality, such as the russetting of the epidermis of Golden Delicious and other varieties of which this is not a natural defect”. “In peaches, the development of certain cracks in the suture line and certain colour defects can be attributed to the presence of certain viruses: but they often have no bearing on gustatory quality.” “Healed traces of damage by insects, by physiological disorders or light hail automatically entail the down-grading or elimination of fruit; but they are nearly always totally unrelated to the intrinsic quality of the product.” “Mention must also be made of the extent to which certain consumers are struck by the discrepancy between the term extra’ applied to the highest grade and the flavour of some of the products so graded.” “It just so happens that many of the standards of quality laid down in the community norms are also the visual criteria which are used for assessing the intrinsic quality of fruit and vegetables when these are produced from a single plot of land. Obviously, when the produce is from different origins, any comparison based on these criteria is devoid of significance” (27).

“It is also stated that many cultivars have been bred for their resistance to handling damage rather than for their flavour” (27). “For example, many cultivars today have been bred for favourable appearance, to the neglect of other factors, hence strawberries may be a most attractive scarlet colour, but they may be almost devoid of flavour. Alternatively strawberry fruits which have been bred to withstand transportation over very long distances, may be very tough and unpalatable when consumed” (215).

An example of the difference between grade and eating quality occurs with apples. It is widely accepted by food scientists that the best Golden Delicious is one that has ripened to a golden colour and has a red blush on it (26, 27, 123). However, the EEC regulation (70) says that Class Extra may have only small isolated traces of fine reddening, that Class I may have not more than one fifth of the surface slightly

reddened, and Class II and III may have not more than one half. This limit applies to the total discoloured area - the reddened area plus any brownish marks round the stem base or eye cavity - so it is stringent. The tolerance for thick reddening is lower: none for Class Extra, one -twentieth for Class I and one -third for Class II. However, thick reddening is rare with Golden Delicious. This regulation is enforced (124). Because of this the best eating apples are downgraded.

The consumers do not act in accordance with the reports of food scientists. Consumers in Northern Europe tend to prefer a more acid apple and prefer to buy a Golden Delicious that is green (26). In these countries the imported apple, picked green, outsells the ripened, golden, home -produced apple. This emphasizes the need to base grades on what the consumer buys, not on what the scientist thinks the consumer should think important.

Thiault emphasizes that even when one can identify the attributes, which indicate good eating quality for fruit of one cultivar from one source, one cannot assume that the same attributes will indicate good eating quality in fruit from other sources. For example, if French and Irish Golden Delicious are an identical shade of green, the French apples can have a pleasant sharp flavour, while the Irish are so immature as to be unsaleable. While he believes that, generally speaking, EEC standards have some relation to the eating quality of many fruits and vegetables, there are so many exceptions that grades cannot be taken as a guide.

It is conceivable that different fruits and vegetables could be assessed on their health -giving properties and that advertising and promotion could be based on this. For example, twenty years ago it was shown that it was possible to reduce the level of cholesterol in the blood stream by eating apples (126, 127) and since then there have been sporadic attempts to use this fact to promote the sales of apples. Oranges and blackcurrants have been promoted for their Vitamin C content, and salads for their slimming effect. It is not necessary to have a factual basis for such advertising: the story that night fighter pilots improve their vision by eating carrots was invented to hide the existence of radar and the Popeye cartoon had an enormous impact on the sales of spinach. However, the situation is that grades do not reflect differences in health -giving properties.

It must be accepted that one can promote fruit and vegetables on the basis of their health -giving characteristics at least as well as on the basis of their organoleptic characteristics. It is generally agreed though that it is not desirable to base a grading system on them. "Some authors think that the classes should be based on the nourishing characteristics of the products and put forward the hypotheses that the specialists' preference (and not the consumers') should orient the classification. Meanwhile these suggestions do not stand a deeper analysis" (142).

It is important that one should not confuse the introduction of a grading scheme for the population as a whole with the relatively sophisticated marketing strategy of branding a product designed for one particular sub -group with an unusually high interest in organoleptic or health -giving properties. The two strategies are entirely different in aims and execution.

Again it must be emphasized that it is what the consumer will pay for that matters, not what she thinks or an expert thinks is the best product.

One important development in the long term is going to be the marketing of fruit and vegetables, which are guaranteed to be of superior eating quality, to have superior organoleptic qualities. The work of Thiault (26, 27, 28) is particularly important in this respect. He had shown that it is possible to develop a sub market for fruit with guaranteed flavour. By guaranteeing that certain apples had an exceptional flavour he was able to obtain a price 20 -35% higher than the average. Such a marketing strategy seems to depend on branding and advertising, combined with strict quality control for organoleptic rather than visual attributes. Indeed, market research in the United States has shown similar responses when there was no change in the quality but there was a larger display and, less important, more advertising. Under these circumstances EEC grades are quite irrelevant. Thiault makes the point that, as long as the grading specifications are altered as described above and tolerances on purely visual attributes are relaxed, the EEC regulations need not hamper this marketing programme (27) even though they do not help it.

However, the purely visual attributes are not unimportant to the distributor: ceteris paribus blemished fruit will sell more slowly than unblemished fruit so both retailers and wholesalers want to be warned: the proposed relaxation in the tolerances will give them less protection, and could, therefore, make the grading system less useful at wholesale. Since (a) the EEC regulations do not help in this form of retail marketing (b) the existing regulations hamper the marketing of certain high quality produce and (c) the relaxed criteria will make the grading system less useful at wholesale, it must be concluded that the system would be easier to operate if the EEC standards were not compulsory at retail. In a case like this compulsory labelling can reduce the credibility of both the brand name and the EEC grade. If the tasteless product is classified 'Class Extra' on purely visual attributes (27) and the high flavour product is marked Class III consumer will assume that someone is not telling the truth.

When there is no special promotion for the high -flavour product, it is doubtful whether the retailer will manage to convey to the consumer the fact that it is a high flavour product. After he has written down the legally required information, the price (and sometimes the unit price), the grade, the nature of the product, the variety (sometimes) and the place of origin, he has not the space to display a brand name effectively, still less to advertise the better flavour. In France it is illegal to use any quality labels except those laid down in the EEC regulations (27).

DISTRIBUTION OR CONSUMPTION GRADES

It cannot be stated too strongly that the system of grades that is most useful at wholesale level is not necessarily the most useful at retail. This is a point made repeatedly by economists, (e.g. 5, 14, 30, 27, 132, 133) but non-economists seldom appreciate it. It is obvious that for most goods the grading standards used at wholesale bear no relation to those used at retail. The international wheat, cotton, tobacco, tea and wool markets, for instance, have highly sophisticated grading systems but these grades are not used at retail, because they mean nothing to the consumer. In spite of this, some producers consider it self-evident that it is impossible to have a grading scheme working at wholesale if it is not enforced at retail. They feel that it is quite pointless for them to grade their produce when retailers may mix up grades or mark grades wrongly (e.g. 147).

Wholesale and retail grades serve a different purpose. It is possible to grade produce according to attributes that interest the retailer but not the consumer. For example, the retailer will achieve a higher margin if the produce has low wastage, and he will be willing to pay more for this, even though the consumer does not see any difference in the product she is offered. If the product is relevant to the consumer it will affect the rate of sale and so will affect the retailer's profit, but in a different way. Shaw (133) draws the distinction between savings in procurement and handling, which affect only the retailer, and selling economies related to consumer preferences.

We cannot, therefore, assume that, because the EEC grading system is quite irrelevant to the consumer, it will be equally irrelevant to the retailer and wholesaler. The discussion so far has concentrated on the effect of the grading system on the consumer. In the next few chapters the effect on retailers, wholesalers and producers will be discussed.

Many of the criticisms made of the EEC system as a system of consumer grades apply equally to it as a system of wholesale grades. It is not based on research. It is not based on demand patterns in any market. It does not permit market development by producing or sorting a product to fit the needs of one segment of the market. These criticisms are quite enough to damn the system. Some other criticisms, that the product is bought on inspection, for instance, do not apply as directly during the distribution process, so they must be examined more closely.

It is clear that the EEC grading specifications were designed with the wholesaler and retailer in mind rather than the consumer. For example, the specifications concentrate on those aspects of quality that interest the trader, like uniformity, packaging and keeping quality. It is of interest to the wholesaler to know that

apples and strawberries have the stalks attached and so are likely to last longer, so it seems reasonable to mention this in the specifications (70, 50)' The customer is only interested in the end result and ceteris paribus, the absence or presence of stalks is not likely to affect her choice. In fact, many customers prefer strawberries with the calyx and plug removed, provided the quality is all right in other respects (22). Similarly it is of interest to retailers to know that cucumbers are crooked, so packages must be marked "curly cucumbers" and relegated to a lower grade (53, 61), but the information is of no interest to consumers who can see for themselves. If the EEC grades were called wholesale grades, were designed to meet the needs of distributors and were enforced only at wholesale, many of the objections would fall away. However, they are enforceable and are enforced at retail sale, and some of the specifications appear to be aimed at consumers.

Interestingly, beef grades have been designed for both handling and procurement economies and consumer satisfaction. A side of beef may carry one grade for conformation and 'cutability', which determine what percentage margin the butcher will be able to obtain, and another for tenderness, which largely determines the satisfaction the consumer gets from her meat. The concept of having ordinal grades, - top quality, second quality and third quality - to cover all aspects of quality was abandoned long ago.

"The whole 'grading' question has been clouded because grades are often used for purposes completely unrelated to the product characteristics on which they are based. A grade designed to classify a fruit or vegetable for the purposes of pricing to a cannery may not serve a similar function in the fresh market" (133).

Similarly, grades designed for the use of the wholesalers and distributors may not be the ones most relevant to the consumer. The retailer wants to know if the product will still be of merchandisable quality when it goes on display. He wants to know whether it will make an attractive, uniform display. He wants to know whether it has any attributes that will make it sell unusually slowly. The wholesaler, especially the primary wholesaler, also wants to know how long it will keep and how it will stand up to transport and rough handling. The consumer is not interested in all this; she is only interested in the end result, what it is like when she buys it.

The relevance of a grading system to wholesaling and retailing cannot be discussed in vacuo: it must be related to the realities of trading and of running a business in the real world. I can only speak authoritatively about the British and Irish retailing and wholesaling systems and I propose to concentrate my discussion on these. The systems in other EEC countries, except Holland, are similar in many respects and many of the conclusions will apply equally there. In Holland the auctions dominate the wholesaling scene so the analysis is not as applicable there and many of the conclusions will not apply. As far as possible, I have pointed out where my conclusions may not apply to different systems.

Many of the EEC requirements on marking and labelling of produce at wholesale are irrelevant in some countries and are ignored, e.g.

Tomatoes should be marked "Ribbed", "round", "elongated" or "plum" and "grown under glass" (Reg.

211/66).

Method of sizing cauliflowers should be marked (Reg. 23/62).

Variety of strawberries should be marked (Reg. 58/62). While this may be desirable, it is seldom done.

Variety of garlic should be marked (Reg. 10/65).

Celery should be marked “ribbed celery”, “blanched” etc. (Reg. 41/66).

In other cases the commercial marking requirements are far more important than the grade, yet the grade is marked but not the size, count, colour, variety, etc. It would appear that a standard format is being applied to all fruits and vegetables, without regard to their special needs or the market in which they are being sold.

RETAILERS

A grading system could benefit retailers in the following ways:

- (1) It could increase turnover.
- (2) It could increase actual margin by reducing waste and similar leakages.
- (3) It could reduce handling costs.
- (4) It could reduce space requirements.
- (5) It could reduce procurement costs.

Any grading system, including a completely informal system where everybody is free to choose his own grading system, may produce some of these benefits. The question is whether the EEC system produces more benefits than alternative systems and, if so, whether these outweigh any extra costs.

Turnover

Increases in turnover of the retailing industry as a whole will arise if consumers buy more fruit and vegetables. This does not necessarily benefit retailers: the increased turnover may be at a somewhat lower price so retailers get much the same margin for handling a larger turnover. The increased sales could be handled by a larger number of shops, so that turnover, and profit, per shop remained the same.

The possibility of the EEC standards resulting in greater sales through greater segmentation than is achieved with alternative systems has been discussed above, and it has been shown that, if anything, reduced

efficiency in segmentation can be expected.

There is a possibility that improved appearance of the produce on display, due to increased uniformity and reduced level of sub-standard produce will increase sales. Increased consistency of quality over time would increase consumer satisfaction, (this increases sales to the shops offering most consistent quality but may not have much effect on total sales). The question of whether the EEC system is better for providing consistent quality and good quality than alternative systems is discussed below under "Procurement". The question of whether the EEC system has in fact had any effect on quality is more difficult to answer: one must show not only that the introduction of the EEC system was followed by an improvement in quality, but that the EEC system caused the improvement. One could argue that the consumer demand for improved quality in all goods in the last thirty years was followed, first by an improvement in quality of all goods and then by legislation which, for most commodities, was aimed at those manufacturers using fraudulent or semi-fraudulent selling techniques rather than at the average manufacturer. In Ireland the position is more clear cut: there was no improvement in quality following the introduction of EEC regulations, so no increase in sales can be attributed to the improvement. A study of quality of fruit and vegetables on sale in Ireland was carried out in 1973, when the grades were first introduced (128) and observations were made at the same time of the year in 1977 and 1978 (135, 136). There was no indication that quality was better in the later years except for tomatoes. The standard of grading and presenting tomatoes had improved over this period, but this was due to strong pressure by producer groups who were trying to produce a product that matched the demands of the export market. There is no reason to believe that the EEC grading system was necessary for this, or that it could not have been achieved more rapidly and cheaply with the alternative proposed. The presentation of Irish grown apples appears to have improved in the first part of the period, but this seems to have been because of increased competition from well -graded imports once quotas were removed: the quality fell sharply in some of the later years. Again, the commercial pressures would have existed even without the EEC grading system and a more adequate response would have been achieved with the alternative system.

The effect of improved labelling on sales has been discussed above. Again there is no reason to believe that EEC labelling has increased total sales.

There can be no doubt that a retailer can have lower costs if he buys a closely sorted product. For example, if he buys a badly sorted package, with swedes varying in weight from 0.25 kg to 5.5 kg, (as has been observed) he must price each separately and quote the unit price. If the product were closely sorted he would price them "20p each". This saving in handling costs does not apply to all products - cauliflowers, cabbage and apples are the most important - and the saving may be limited by national unit -price legislation. If the items vary in size and quality, the smaller or otherwise inferior items can be expected to sell more slowly and eventually most of the produce left on display is of this quality. This can be a real problem (136, 137). With closely sorted produce, too, consumers spend less time searching through the display for the best buy. This reduces the damage caused by excessive handling and it reduces the number of customers in the

produce department at any one time, so saving space and increasing turnover per square foot.

One sometimes hears of retailers who prefer to have mixed packages of cauliflowers, cabbages, etc. so that they can sell the smaller cauliflowers to single people, larger cauliflowers to customers with large families and so on. I have not come across any such retailers, not even among the small, country, grocers who might be expected to operate in this way. If a retailer wants two sizes of cauliflower he prefers to buy one box of large cauliflowers, one of small.

The question is not whether it pays to buy closely -graded produce but (a) whether the EEC grades provide such closely graded produce, (b) whether produce which is closely graded to different specifications would provide the same or greater savings, and (c) whether the savings in using the EEC system rather than any other, compensate for the extra costs incurred in selling. It has already been shown that the EEC grades are very broad and overlap considerably, so one cannot assume that produce is closely sorted just because it meets the EEC grades. The next section shows that supermarkets do in fact have their own specifications, which are not the same as the EEC specifications, to ensure that they get closely sorted produce.

Driespong (162) found that in the years when the grading system was first introduced to the original EEC member states, standardization down to the retail stage was no big problem for the developed chain stores. The same applied in Britain, where the biggest and most efficient chain stores already had strict quality control and sold a standardized product: all that was necessary was to write the grade on the label. The smaller chains, which cannot afford the same quality control and procurement systems, had considerably more problems. Driespong (162) said that the system had affected small retailers on the continent badly, and, again, the same was found in Britain and Ireland.

When almost any grading system is introduced, there are necessarily increases in some handling costs, as well as falls in other handling costs. With the EEC system there are substantial costs in ensuring that the labels are always correct and the retailer has to bear the risk of prosecution. These costs would not arise with the proposed alternative system.

PROCUREMENT BY SUPERMARKET CHAINS

Supermarket chains and other chains, such as Marks & Spencer and Woolworths, usually buy from specialist suppliers - prepackers, packers, importers or co-operatives, rather than through the normal market channels. This appears to be so in Britain (165, 166), Ireland (128), Belgium (167), France (15, 168), Denmark (169) and Italy (170). In Britain and Ireland about one-third of total produce sales are distributed in this way and in France in 1974 one-fifth was (168). In the Netherlands supermarkets are more likely to buy home-grown produce direct from the auctions (171, 137).

This section is based on the British and Irish systems: the conclusions may not apply as closely to other systems and in particular they will not apply to the Netherlands, with its strongly organized auction system.

The supermarket chains require large quantities of uniform produce. If produce is uniform, the price in all shops in the chain is identical, which reduces administration costs. Distribution is simplified because a consignment can be sent to whichever shop needs it most, rather than to one of the shops that is handling that particular quality, and because it is not necessary to record the destination of each consignment. Produce from different sources can be mixed together and treated as one homogeneous lot. Handling costs within the shop are reduced, as quality remains constant over time and price changes are reduced to a minimum, seldom changing more than once a week. Close sorting keeps waste to a minimum.

In order to obtain this quality, the supermarkets buy on specification from prepackers, importers etc. It is normal for them to state their expected requirements a year to eighteen months in advance and to ask the prepackers, merchants, etc. to arrange to have the required amount produced. The supermarkets may supervise production from the selection of a strain of seed to the harvesting and packaging process.

Each supermarket chain has its own requirements for quality: Superquinn, Five Star, Sainsbury and Tesco each have different requirements, because each serves a different sector of the community. The requirements are closely specified, in a handbook or by custom, and the requirements are well known in the trade, but the requirements do not follow the EEC grades. "Jim Gallagher (Sainsburys) pointed out, supported by Fred Wallis of Saphir, that much of the produce that went into the multiples was, in fact, not involved in the voluntary or statutory regulations that were being applied, but rather was being bought on specification back to the grower. 'It is up to the wholesaler to match quality to the customer' added Mr. Wallis" (172).

Typically a prepacker will pack a range of qualities for customers with different needs. He may sort out the top quality for his most demanding customer, leaving the remainder for his least demanding customers, the caterers buying on the wholesale market. When a field produces 90% Class I the produce is sorted to the requirements of Customer A. When it produces 50% Class I it goes to Customer C. The system achieves a high degree of market segmentation and reduces waste to a minimum. While the large prepackers

in Britain who specialize in a small range of vegetables can operate this system, Irish prepackers cannot achieve the same degree of segmentation because of the smaller market size: they have to pack a wider range of products for a smaller number of chains (128).

Ellis and Kirk (175) believe that the main reason the chain store buyers avoid the wholesale markets “is that they are not a natural and convenient source of supply for buyers who want large quantities of very uniform and rather good quality produce and in practice most kinds of produce capable of conforming to those specifications can be bought more conveniently from grower organizations or be imported direct.”

It is at first surprising to find that most supermarket multiples do not have detailed written specifications and that those who have them do not use them (165). However, the suppliers know what level of quality will be acceptable to each supermarket chain and they can observe gradations in quality that would be extremely difficult to put in writing but are nevertheless of great commercial importance. The supermarkets reserve the right to reject consignments without argument. If any prepacker were to argue about the rejection and point to written specifications to prove that the consignment met the specifications, he might be paid but he would certainly expect to lose an extremely valuable customer and he might go out of business as a result. Market power must be borne in mind in any analysis of grading.

While, in principle, the EEC grades could be used as a basis for a procurement system, I know of no case where it is. The grades are too wide, permit too much overlap, are too variable *de facto* and provide too little definition to be used for buying on description or for long-term purchasing arrangements.

The chains have their own quality control systems, some of them extremely sophisticated, (See Vrancxx (167) for a description of such a system in Belgium), some of them rather sketchy. All of them mean that a higher proportion of the produce is inspected than would be inspected in the wholesale market and most of them require the product to be sorted to closer specifications than would be required by the EEC standards. Most inspections are part of a quality control system and are far more thorough than the inspection of a government grading system (165, 212).’

In fact the supermarket chains have built up a sophisticated procurement and distribution system, which makes the maximum use of grading and sorting to supply each section of the public with the quality, it wants. The EEC grading regulations are irrelevant to this distribution system and any attempt to enforce labelling regulations merely increases costs.

Other Shops

This discussion of the procurement system of retailers other than supermarket chains is confined to the system in operation in Britain and Ireland, though much of what is said will apply elsewhere.

Greengrocers generally buy their fruit and vegetables from commission agents in the wholesale

markets. Small supermarkets and grocer shops generally buy from secondary wholesalers who buy from the wholesale market and deliver to the shops (see 150, 173, 128, 174, 166, 175 for a more detailed analysis of the system).

Distributing wholesalers buy from market wholesalers and distribute to retailers, usually only to small grocers in cities with a market, but to all retailers in other areas. They visit the same retailers every week, and to a large extent, sell to the same retailer each week. Each retailer may have three or more distributing wholesalers visiting him each day (135, 150).

The quality and range available to the retailer depends entirely on the quality and range offered by the wholesaler. "The wholesaler cannot afford to carry a wide range of lines or qualities. Most of the space on his lorry must be devoted to the commoner lines, apples, oranges, onions, carrots and potatoes. If he carries exotics, or even vegetables as strange as cauliflowers, he may have difficulty in selling them. Usually a wholesaler carries only one quality, produce that is sound but second rate. Again, because of limited space in his lorry, he cannot carry everything but must carry only produce that he knows will be cheap enough for all his customers. This means that the demand for top quality may exist at retail or consumer level but it is not passed on to the wholesale market" (135). Under this system the retailer who wants to buy the best does not buy by grade: he takes the best of what is available. The grades are in fact irrelevant. This has been found to be the case elsewhere in Ireland (70, 73) and similar disadvantages were found in England (178).

It has been suggested that a voluntary group system would permit retailers to get a better quality if their trade demanded it (135). The system would be similar to that of a large greengrocery multiple. Again it is argued that the solution to the problem of improving quality lies in changing the marketing system rather than in passing legislation on standards.

The secondary wholesaler system is uncommon in the Netherlands, where most retailers can visit the market, but in Britain and Ireland most of the non-chain store distribution is handled in this way (135, 150, 178).

Greengrocers in big towns or cities generally visit the wholesale market or the depot of a secondary wholesaler. Research suggests that greengrocers do not buy on description using EEC grades, and indeed that they do not use the EEC grades at all in their purchasing (150, 151, 177, 184). Retailers, like consumers, can only get a limited amount of information from the grade label. The grades, being wide, give only an approximate level of quality. "The statutory grades are necessarily somewhat wide in their permitted tolerances and the minimum grades are low ones, so that most retailers will consider it worth their while to select consignments within grades" (178). The grades are often inaccurately marked, because of deterioration after leaving the farm and poor sorting and grading by the producer. (This has also been found in the Netherlands (137)). The inspectors and the growers frequently derogate from the standards laid down by the EEC, so retailers cannot be sure what a Class II or III means.

Retailers have learnt that certain growers pack to a very high standard, and it is common for retailers

to ask for “Kelly’s carrots” or “Egan’s cauliflowers” and to pay a premium price for them. Indeed it is common for growers to mark their top quality cauliflowers “Class III”, in the belief that the grower’s reputation is known and that they will still get premium prices. Wholesalers, retailers and secondary wholesalers inform us that any sales on description on the Irish market follow this pattern, and this method of description is certainly common on the British Market. Frequently, in fact, a greengrocer will say to his wholesaler “I will take all the cucumbers Smith sends in and I will pay a premium price for them”, and it is not uncommon for the premium produce to be sold in this way without ever entering the market. (This may mean that the producer is not getting as high a price as he would if his product was displayed in the market, but this question has nothing to do with the EEC grading system).

This system works in spite of the very large number of growers because, as a rule, each grower sells to only one wholesaler in each market, and each wholesaler has only a limited number of growers producing carrots, for example, (where the wholesaler has several stands on one market, the grower and customer think of each stand as being an entity - their loyalty is to the individual salesman, not the firm).

In Holland, where large quantities are sold for export and where sales are by auction, buyers do not know sellers (137) and in Ireland too it is believed that grading and branding are necessary for exports, as buyers in foreign markets cannot be expected to know individual producers. For this reason the need for a grading system for export markets has been discussed in a separate chapter.

Most vegetables and some fruit are sold in such a way that they can easily be inspected in the market. With some other products, such as apples, the inspection is limited to a glance at the top layer. Here the purchaser must take the product on trust and base his judgement on the information on the label and his knowledge of the packet.

It should not be thought that the retailer is entirely at the mercy of an unscrupulous supplier. It is an accepted practice in the trade that a buyer can return any unsatisfactory produce to the wholesaler within twenty-four hours and get his money back. Even if he does not see that the produce is inferior until he unpacks it in the shop, he can get his money back. If he does so, he loses the profit he would have made on the sale, so he does not reject for frivolous reasons. The costs to the wholesaler and producer of having to refund the price are substantial enough to discourage fraudulent packing. The wholesaler can of course refuse to refund the money, on the grounds that the retailer bought the produce several days earlier and the deterioration is due to age: there is no doubt that some wholesalers abuse this power. However, the retailer has the choice of several wholesalers and will switch suppliers if one proves unreasonable. Retailers generally believe that they are adequately protected against grossly substandard products. They feel that losses are more likely to arise when the produce is substandard, but lies just within the tolerances, and so cannot be rejected (173).

If allowance is made for the fact that retailers have twenty-four hours in which to reject produce and that they are trading with the same suppliers month after month and year after year, there is really very little

difference between inspecting in the market before purchase and inspecting in the shop after purchase. They are in fact adopting a habitual purchase strategy (6).

This distinction between an “experience good”, which it pays the purchaser to evaluate by purchasing and consuming, and a “search good” which it pays the consumer to examine closely before purchase is important in information theory (e.g. 187, 188, 189, 6). The greengrocer treats fruit and vegetables as experience goods, examining them closely after purchase and rejecting them or demanding a credit if they are not satisfactory.

The grades appear to be largely irrelevant to the wholesalers, as might be expected from the wholesalers’ lack of interest in them. Thiault (27) and Bowbrick (177) have found considerable opposition to the EEC grading system among wholesalers.

GRADING AND THE PRODUCER

The effect on the wholesaler as a buyer and the producer as a seller is next to be considered. It is irrelevant to this discussion whether wholesalers buy the product or sell on commission.

It is often argued that grading helps price transparency, so that the producer can see exactly what he gets for each quality and what the consumer pays for each quality and so that he can switch his production to meet the consumer demand. In so far as the grades help him to do this they are to be welcomed, but there is in fact no reason to believe that the grades give this transparency or that producers could or would change their production as easily as the model suggests.

It is sometimes assumed by people not in the trade and by non-economists that once one knows the prices of the different grades the production and marketing strategy is self-evident. It is sometimes even assumed that it is self-evident that it is in the producers' interest to sort as much into Class I as possible. In fact, for the reasons discussed in the section "Practical Problems" and because of the complexities of the analysis involved, the decision is seldom clear-cut. For example, in Ireland we attempted to use price data to demonstrate to growers that it paid them to sort the maximum possible quantity of tomatoes into Class 1. We found it impossible to reach any conclusion for the following reasons: -

Some wholesalers specialize in selling Class I tomatoes and get a good price for this grade but they sell very little Class II or III and get relatively low prices for them. Others, who supply a different segment of the market, such as country retailers or retailers in the poorer areas of the city, sell mainly the lower grades and get a relatively high price for Class II and a relatively low price for Class I. Any producer who produces a large quantity of the lower grades is likely to get a higher overall price from the second wholesaler. One must, therefore, collect price data for both types of retailer.

The actual prices paid could not be obtained, as wholesalers do not use EEC grades in their returns and growers do not pack to EEC standards. The terminology used is the traditional terminology of the market: "D", "DE", "roughs", "chats" etc. and it was not possible to equate these grades with EEC grades. It was found, too, that it was not possible to equate the grades used by one wholesaler or producer with those used by another. There was a very wide range of quality sold under any description.

The "ungraded" produce was sometimes sorted for size, but not for colour, sometimes for shape but not size or colour, and sometimes it was not sorted except that the small tomatoes were removed. There were a very large number of possible combinations and it was impossible to relate any one combination to a single price. Even if it had been possible to do so, the number of observations would have been unacceptably small.

There were also most of the difficulties discussed in the section “Data Problems” for example the fact that a single wholesaler would receive a range of prices for one perfectly uniform grade in a single day.

Conniffe (181) gives an idea of the analysis an individual would have to do each time prices changed. Other analyses, such as that of Zusman and O’Regan (211, 181) are equally complex. Matsumoto and French (183) develop a model for ascertaining the optimum allocation of sprouts into grades, when these are defined according to one variable (size) only. In spite of the simplifying assumptions, such as the assumption that there is a single quality attribute, all these analyses are far beyond the farmer’s ability. Data availability would be a further limitation on the use of the model even when very good statistics were available.

There are further complicating factors such as the fact that growers who consistently produce Class I can expect to get a higher price for it than those who only produce it from time to time.

Sorting is the only way of changing quality in the short-run, but in the longer term changes in production techniques must be taken into account. Growers also have to choose between cultivars producing less acceptable fruit and a higher proportion of roughs, and cultivars producing more acceptable fruit which does not travel as well and which is less suitable for the export trade (e.g. Grenadier and Sonato).

The producer may get a higher total return from lumping Class I and Class II together than he would from sorting them and selling them separately. For example Nichols (35) has shown that in a market where Texas grapefruit had long been accepted and no effective competition from other supply areas had existed, sales were not affected measurably when customers were offered US no. 1 instead of a combination grade with a mixture of US no. 1 and US no. 2. Smith and Frye (179) found that, if Red Delicious were sorted for colour, sales of the highly coloured apples were significantly greater than sales of partly red apples. A combination of the two had an intermediate level of sales and had very much higher waste resulting from more handling of individual fruit by customers. “Despite higher spoilage loss, the combination display produced higher sales and greater gross profit to the retailer than displays of partly coloured test fruit”. In Britain some apple prepacks sold in the supermarkets and some boxes in the market are mixtures of two grades. The packers are concerned with seeking a balance between what the market can sell and what the packhouse finds the most economic to handle (180). It is pointless to get a premium for Class I if the price for the Class II that is left falls too far. The packer has to sell all that enters his packhouse, and, unlike the retailer, he cannot insist that only one quality enters his premises.

One prepacker carried out a trial in conjunction with a supermarket chain, selling Class I or Extra vegetables in some shops and lower grades in others, using controls for the periods immediately before, immediately after and during the trial. Only with cauliflower did sales increase significantly when the improved quality was offered (184).

The tolerances for Class II are usually 10% compared with the 5% of Class I so a higher proportion of the total quantity entering the packhouse can be sold if everything is packed in combination packs marked Class II.

One growers' group examined the labelling and grading of field-packed produce and concluded that the act of labelling is commercially a waste of time as there was no reason for or use of the label at any time in the distribution chain (185). The present marketing system, they found, depends entirely on supply and demand and any change in EEC regulations would have very little effect on the industry. The costs of applying the labels and ensuring that they represent the product in the box are not negligible. The cost of printing the label and applying it to a wooden box can be as much as the cost of the container. "The work involved in statutory grading is no guarantee that a premium price will be obtained unlike that of supplies to direct outlets where a premium is paid for special grading. In the market all purchases are made on sight and examination and reputation". "The committee found no one who said that produce was bought because of the statutory grade" (185). One of the biggest prepackers in Britain found that "very often the cost of supervision and quality control etc. can equal the cost of the packaging operation" (186). "It must not be concluded that patternisation is accepted peacefully. Structural changes always involve some cost or expense. It is possible that the change in industrial localization may involve considerable damage to agents already established, or that the intensification of the competition process may eliminate marginal producers or traditional trade marks" (142).

SORTING COSTS

The largest and most important costs are not the handling costs incurred, but the financial losses arising from sorting.

If a product is part Class I and part Class II, it must be marked Class II. It will, however, be a good Class II and the buyer may, after inspecting it, be willing to pay a price that is close to the minimum Class I price. If a single firm sorts this product, the Class I will receive the average Class I price and, therefore, will receive a higher price for it, a benefit. The Class II will receive a lower price, the average Class II price (or even lower if 10% of the best Class II is sold as Class I within the levels of tolerance). This is a cost. The balance between costs and benefits will depend on the composition of the unsorted product. Several examples have been quoted of its being more profitable to sell an unsorted product (35, 179, 180, 184).

A rather cruder model, assuming that all Class I is uniform, all Class II is uniform etc. will perhaps show the situation more clearly. A mixture of Class I and Class III is sold as Class II. After sorting, the grower gets a higher price for his Class I and a lower price for his Class III. Whether he makes a net loss will depend on the proportion in each grade and the relative price. For instance a Class III may be of such low quality that it is unsaleable if the market is well supplied. In this case it would not normally pay to remove the Class I and II that is mixed with it and brings it up to a quality that is saleable, a "good Class III".

Tolerances should also be taken into account. Conniffe (181) has described an ingenious method of extracting the maximum return from a product by taking full allowance of the tolerances, so that Class I has

the permitted 5 or 10% of Class II and Class II has the permitted 10% of Class III. The model assumes that Class I is homogeneous and it is therefore of limited application to the fruit and vegetable industry. It applies when people buy on description but not when they inspect before or after purchase.

The important thing to remember is that there is always a sorting cost, though the benefit may outweigh it. All too often, people are advised to sort on the grounds that the increase in the price of the top grade is greater than the physical sorting costs, and the effect on the price of other grades is ignored.

The costs of labour, machinery etc. in sorting are small relative to this loss in price, but they are usually still significant. The cost of sorting a high value product like tomatoes may be insignificant in relation to its price, but for other products like cabbages, cauliflower and carrots, sorting costs may be more important. The cost may come not in the physical sorting operation but in the increased time it takes to select a head of cauliflower for cutting. The cost may be the substantial one of bringing cauliflower, cabbages or sprouts into a packhouse to get Class I instead of packing Class II or III in the field. Once the product is brought into the packhouse and put on the conveyor one might expect that there would be no difference in the cost of sorting to different specifications, but it has been reported that it takes 15% longer to prepack carrots to the specifications of a firm with high quality standards than for the average supermarket (165).

One could go into some detail on the different methods of sorting, differentiating between single operation sorting and two-stage sorting and so on but this would draw attention from the main point: nearly all the costs of sorting are the costs of disposing of the low grades and the outgrades.

USING GRADES AS AN EXTENSION DEVICE

It would seem that one factor taken into account in drawing up the standards was the desire to put pressure on growers to adopt different production methods. It is difficult to say how far this influenced the specifications actually adopted but certainly one of the commonest arguments raised in favour of compulsory grading and compulsory minimum standards by agricultural scientists is that it will force the growers to change their methods and “get rid of those growers who have no commitment to the industry”.

Bauer and Yamey (42) are sharply critical of the use of grading legislation to promote better cultivation techniques. They quote an example where Grade I could only be achieved if the farmer followed the advice of his extension worker and produced high yields. The grower benefited from both the higher price and higher yields and the financial incentive to follow advice was strong. This policy was based on the premise that farmers would not be sufficiently influenced by the extra return from the high yields to change production methods and some further incentive was necessary. If they do react normally, the extra incentive would of course lead to misallocation of resources. The other basic premise is that the market can be controlled. In the case they quote the world market paid very little premium for Class I but the Cocoa Marketing Board paid substantially more for Class I than for Class II.

In the EEC the two basic requirements for such extra incentives are not fulfilled. The growers do react quickly to economic forces and, indeed, it is a common complaint that they act too quickly and too sharply to price changes. A grading system that is related not to consumer demand, but to what the agricultural scientist thinks will produce the highest yields, will result in their being little or no premium for Class I.

MARKET EFFECTS

It is sometimes possible to work out the optimum sorting strategy for an individual producer, especially if he produces a crop that is 90% Class I or 90% a uniform Class III. Even then the solution is based on the assumption that no other producers change their sorting strategy in response to the change in prices, etc. This is quite unrealistic.

If, for example, the price of Class I is 50% higher than the price of Class II, the individual producer may calculate that it is in his interest to change his production and sorting methods to produce more Class I and less Class II. If everyone makes the same change, there will be an increase in market supply of Class I, reducing its price, and a reduction in the supply of Class II increasing its price. Even with a single-attribute product the prices may come very close. Where the Class II has different attributes rather than less of the same vertical quality attributes, (e.g. it is organically grown or the cucumbers are crooked), the Class II price may be higher than the Class I in the second period.

In the second period, therefore, some producers will find it does not pay them to sort when the prices are so similar, and they will revert to their old sorting methods. The equilibrium position is most unstable: it would pay many individuals to produce Class I, but if they did the total return to producers would fall.

Economists are sceptical about the possibilities of working out the impact on different interest groups after market effects have been taken into account. Mehren (3) concludes, "There are few statements of theoretical criteria for optimum change in quality grades specifications. Yet, most such statements are fatally afflicted by failure to refer to several operating facts of actual markets: short -run sub demands are often not known, static or independent; they are sequentially interrelated in that alternative allocations among them in one or several periods may engender changes in form and level of both demands and outputs of the controlled commodity and others related to it in production, demand or both; conceivably, grade and brand specifications and combinations may themselves alter preferences, demands and perhaps production techniques over time; and, perhaps most important, demands themselves may be functions over time of the introduction of new grades, brands, qualities, in short, of new product development".

Freebairn (138) agreed, "operationally it has proved extremely difficult to quantify the effects of grading on producer returns. The true demand functions are not always known and if they are, they are interdependent and rarely static. In the unlikely event that demand functions for the grades were known, independent and static it is easy to make an assessment. But, since the grades of a commodity are, by

definition, substitutes, their demand functions will be interdependent.... In practice, partly because of the theoretical complexities and partly because of a lack of knowledge about buyer preferences, the effect of grading on the aggregate return of all producers is extremely difficult if not impossible to predict”.

Another consideration to be taken into account is that growers will have different optimal production and sorting strategies. If a man produces 90% Class I he can produce a Class I package with little sorting cost. If he produces 50% Class I his sorting cost is likely to be much higher. For any producer the marginal difference in prices needed to justify a switch is likely to be different, depending, among many other factors, on the proportion in each grade. The vegetable merchants in Lincolnshire select fields that contain mainly Class I cauliflower for producing Class I packs, and select others for field packing of Class III. The marginal cost of sorting varies from one field to another, not just from one producer to another.

Because of changes in production techniques it is easier than it was to produce Class 1. With glasshouse tomatoes, for instance, efficient commercial growers produce a very small proportion below Class 1. Class I is, therefore, in plentiful supply in relation to Class II and the premium for Class I is much lower than it was. Where once it paid handsomely for a producer to switch to producing Class I only, the premium is now so low that one must wonder whether growers would produce as much Class I if the cultivation techniques that produced the highest yields did not tend to produce Class I.

Once the producer has made the decision to produce and sort to a certain standard he is likely to continue to do so until there is a strong incentive to change. This is partly due to habit and partly due to the fact that the premium paid is related to the producer's reputation for producing a top quality product as well as to the quality of the packages offered, and he would get little extra if he improved his quality for a short period only.

PRODUCER ORGANIZATIONS

Increasingly, producer groups and co-operatives are controlling the marketing of horticultural produce and they are making use of grading and branding as part of their marketing strategy. Grading is particularly important when exporting, as the British buyer does not know which Irish or Dutch tomato grower packed the box and he must rely on the grade plus inspection, rather than on trust built up over years of trading. For this reason most exporters are scrupulous about their grading and the grading inspectors concentrate their efforts on produce that is being exported. The member states are required to “give priority of inspection to products dispatched in large, complete loads from a given forwarding area to other community areas” (62). Similarly, new co-operatives, which are anxious to build up a reputation for quality, pack strictly according to the regulations and welcome the help of the grading inspector. If the growers object to the assessment of quality by the co-operative, the inspector is there to give an authoritative, independent view.

The demand for these services seems to be restricted to a few crops such as tomatoes, apples and cucumbers, probably both because the grades are more meaningful for these crops and because they are the crops most frequently exported.

Since no EEC country has the resources to inspect all horticultural produce at all levels of distribution, the inspection should be concentrated on those points at which it produces most results and at which there is most co-operation. Clearly, export-packing stations are a priority and apple-packing co-operatives might be another. It is worth concentrating on those crops whose price is most affected by grading and on those producers and co-operatives that want the service, rather than on those that are obstructive. This means that, instead of the inspectors being scattered over the country, trying to inspect all products at all levels from farm to retailer, they concentrate on a few products at a few key points and they have a big impact on these products. Even if only a third of the product, say apples, is thoroughly inspected, the effect on the price will encourage other producers to adopt the same standards. Over the years the inspectors can switch from one product to another, as the producers and distributors demand their services.

This allocation of scarce resources would produce a much bigger return than the present system where the resources are spread too thinly to be effective.

MARKET IMPERFECTIONS

Economists working on horticultural marketing are constantly trying to remove those imperfections in the marketing system that result in the consumer's preferences not being communicated to the grower. There are many reasons for this loss of market transparency. Most of current research on horticultural marketing is aimed, directly or indirectly, at improving the situation, and the action that is being taken includes improvement of physical facilities like markets, stores and packhouses, improvements in techniques like packaging, advertising, market research and market information. These measures are improving the efficiency of the marketing system in many ways including market transparency.

Undoubtedly an effective system of grading or branding can help improve market transparency, if the grades are based on market research and correspond to the consumer's requirements. It should not be thought, however, that this is either a necessary or a sufficient condition for market transparency. There are a lot of reasons why markets may not be transparent even if there is a perfect grading system, as the following example based on (21) will show: -

The reason for poor quality in the shops may be that the marketing system does not communicate the consumers' preferences to the grower even if everything is excellently graded. Retailers and consumers frequently complain that they find it difficult to obtain the produce they want even if they are willing to pay extra for it. Growers complain that they receive little or no premium for top quality and they can produce sales records to show that this sometimes occurs. Some growers report that they get higher prices if they split consignments, sending several small consignments to different wholesalers or different markets, though one might expect that the opposite would be true because of the increased handling costs and because chain stores want to buy large quantities of uniform produce. In Ireland it has been found that there is no apparent relationship between quality and retail prices if a random sample of shops is taken but there is if shops of similar purchasing power are compared (23).

One explanation is the system of discounts. A chain store buying large quantities may demand and get a discount from a wholesaler. If the wholesaler has a surplus of a perishable product like tomatoes, he may offer 500 boxes at a discount of as much as 30% to a bulk buyer and especially to a bulk buyer who does not usually buy in that market but buys through his own procurement system. This means that the wholesaler can sell the remaining supply to his regular customers at a higher price. The small retailer who buys only two or three boxes has to pay the full wholesale price.

The chain stores aim to buy large consignments of uniform Class I and they pay a reduced price for it. The small retailers have to take what is left, the small consignments of Class I and Class III, which many of them prefer. They pay the full price for it.

As a result, growers may get much the same price for a large consignment of Class I as they do for a consignment of Class II. As the difference in price falls, it pays fewer growers to produce Class I. The equilibrium position depends on the elasticity of demand and supply of Classes I and II and alternative goods, their cross-elasticity, the marginal cost of sorting and losses in sorting.

The simple model, based on the observation that discounts are given mainly to firms buying large quantities of Class I explains a wide range of observed phenomena, but it is of course not meant to be a complete explanation of how market forces work.

If the model is correct the phenomenon would not arise in an auction system, where no discounts are possible as the grower would be aware of it and protest if any were given. Donelius (193) found that, on the Swedish auctions, big lots of good quality made a higher price than small lots of good quality (again reflecting the chain store demand for large quantities of good quality) but that big lots of inferior quality were sold at lower prices than small lots of the same quality. This tends to corroborate the model.

Another way in which wholesalers can distort the market, so that producers do not get the full return that their quality would justify, is the following: -

If the wholesaler is selling some goods on commission and is selling others that he has bought firm or has imported himself, it is in his interest to promote the sales of his own goods at the expense of those he is selling on commission. At one extreme he may feel that if he sells someone else's product he may not be able to sell his own, but more generally he gets 100% of any extra price he gets for his own product and only 10% of the extra price he gets for what he sells on commission (20).

There are several ways in which he can get a higher price for his own product even if it is not different in the eyes of the buyer. If he offers large buyers a discount, he delivers the product sold on commission. He can sell a large buyer his own product at a high price and the commission product at a lower price, knowing that the buyer will not mind as long as the average price is right. The monopolist may sell commission items at a cut price to customers with an elastic demand, like caterers and processors, and so reap the profits of discriminating monopoly. Prices in a market vary over the day and over the week so the wholesaler can sell his own product at times when demand is strong and sell the other produce when demand slackens. If the products are differentiated by brand or country of origin the wholesaler may advertise his own product, putting up the demand for it. If a customer asks for guidance, the wholesaler can always say that his own product is the best - an extremely effective form of advertising. When a prospective customer asks for a quotation he is given one for the wholesaler's own product. All these practices may be carried out quite unconsciously, without the wholesaler realizing that he is abusing his position.

The practices of averaging and levelling prices may also hide returns. A wholesaler who gets a range

of price through the day may pay the same for all Class I and the same for all Class II at the end of day with the intention of ensuring that senders are not penalized for the fact that their consignment was the last to be sold. One effect of this is that the man who produced an extra good Class II gets the same price as the man who produced a barely adequate Class II or even the man who marked his Class III as Class II.

Dishonesty is widespread in the wholesale markets (174) and salesmen may pocket some of the return. It is easier to get away with this if someone gets an above-average price for his Class II, so growers may find that it pays to produce as near the bottom of the grade as possible.

It has been pointed out above that optimum grades at wholesale are not necessarily the optimum grades at retail. This means that there is a possibility that consumers' preferences will be reflected in farm gate prices, but it is quite likely that these preferences will be swamped by other influences.

Poor market reporting and delays in getting sales figures from wholesalers mean that growers are not always aware of the prices they are getting for the different qualities, and so the information on consumer preferences is not effectively transmitted.

It must be concluded that a grading system, however well designed and relevant, is going to have little impact as long as these market imperfections remain. The first priority must be to improve the physical and institutional inefficiencies of the distribution system. Once this is done the grading system may be effective. It is more likely that once this has been done the EEC grading system will be seen to be redundant.

BRANDS AND GRADES

More and more co-operatives and marketing organizations are going one step further than using EEC grades, and are branding their products. Branding demands better sorting, more consistent quality and better quality control, but if a brand can be established a premium price can be obtained. Some of the exporting countries have successfully established a national brand "Cape", "Outspan", "Maroc", "Carmel" and "Guernsey Tom" for instance. Within a country a single packer can achieve this: "Geest", "Home Grown Fruit" and "LSA" are well known names in Britain. Some packers in exporting countries are attempting to establish their own brand names at the expense of the national brand name - the French apple packers are an example. Some importers are selling imported fruit under their own brand names "Saphir Anjou Apples" for instance.

There can be no doubt that more and more producers are going to attempt to establish a brand image in the future. Branding involves more than just stamping the name of the firm on the box. Until the buyers are convinced that boxes with that brand are in some way different from other boxes, they will ignore the brand. In spite of the fact that most boxes have the producer's or packer's brand, and expensive publicity campaigns have been launched, it is doubtful whether brands have much effect at consumer level. Customers are aware of some national brands, especially for oranges, but private brands are not important. Tiger (29) concludes that in France "Labels are still far from being known and from reliability. One woman is three believes that a label may be a good guarantee of quality". It is not known whether they act on that belief.

At wholesale level brands are more important, but, even so, many brands are ignored. This may be because the producer sells too little on the market to make a reputation or because quality is too poor or too erratic to make a premium.

One important reason why brands may fail to get a premium price is that the brand does not tell the buyer anything that he does not know from the Class mark. If "Acme" brand means only that the product is Class I, the buyer will buy at the Class I price. To be successful, a brand must say something different. A successful brand usually means that the product has been sorted to specifications designed to meet the requirements of one section of the market. It may, for example, be sorted to very low tolerances or be unusually consistent over time, or particular emphasis may be given to one aspect of quality. With many of the successful brands, like LSA, no one would have any hesitation in buying on description.

The firms that want to advertise notice that many of the benefits of generic advertising go to firms that do not contribute to the advertising budget and so, they prefer to advertise their own brands (191). A

thorough study (192) was made in West Germany of the effectiveness of producer groups which had a comprehensive marketing policy including improving the product quality, contracts with traders, control of daily supply, minimum prices and acreage limitation. It was found that

“the main advantage of supply control is going to the unorganized producer and not to the producer groups... It is always more profitable to take the free rider position than to submit to supply control”. One implication is that it does not pay to control supply unless the producer groups control most of the market. However, brand differentiation, by reducing the cross elasticity with the free rider’s produce and also making it more difficult for producers to leave the group, temporarily or permanently, would increase the benefits from supply control. Williams (14) and Brunk and Darrah (30) also emphasize the free rider problem.

There is little possibility of market segmentation by selling fruit with a guaranteed flavour at a higher price for instance, unless there is a system of brands. No grading system is adequate for this. Meulenbergh (24, 158) goes so far as to say “In our opinion, grading and sorting can never be so refined that they superseded branding as a guide to market segmentation.”

If there is effective branding by the leading firms in the industry, there will be pressure on other firms to introduce branding. They will find that, with effective brands, they too can get a premium price. One might expect too that the smaller the percentage of total production that is sold by grade the less confidence buyers will have in grades.

In the auctions in Sweden, each grower’s produce is sold individually and the buyer knows whose product is being sold. While products are sorted according to grade, the individual treatment seems to be militating against both the use of grades and the use of brands (193).

The relative merits of a system dominated by grades and one dominated by brands are not clear. It has been suggested that one effect of the introduction of US beef grades has been to break the monopoly of the large packers whose brands dominated the market, and so to give the small packers a larger share of the market. By analogy, one might argue that EEC fruit and vegetable grades will help the small producer group and the individual producer compete with large co-operatives and importers. On the other hand, effective brands certainly extract more consumer surplus (191), and can be an effective marketing tool, more effective than grades. Whether or not one approves, one can see that branding will be more important in the future and that this will lead to a reduction in the use of grades.

LONG-TERM EFFECTS

If a grading scheme does result in short-term benefits to producers or distributors, it is likely that many of the benefits will be lost in the long-term. There may also be some shift in the benefits to other sectors of the population.

The simple textbook model illustrates this. If a change in the grading system results in a reduced distribution cost, the cost curve of the retailer falls, so he is in a position to make supernormal profits. In the long-term, competition will force him to reduce his price until he is making only normal profits, and the consumer benefits in the long run.

If the reduction in distribution costs or the increased demand by consumers results in increased demand at market level, the farmer gets a higher price for his product in the short run. In the long run, farmers increase their production and the price falls so they get only normal profits.

These two models are very crude and can give only a general indication of what would happen. Feeney (190) has constructed a rather more complex model, based on the realistic assumption that retailers and wholesalers have a fixed percentage margin, which they charge whatever the quality of their input. He examines the impact of an improvement in quality, which reduces their level of waste, and, therefore, increases their profits. The impact depends on the elasticity of actual and derived supply and demand curves, but, in general, it would seem that the benefit goes entirely to the distributive sector in the short -run, with consumers getting no benefit and growers facing a reduced demand. In the long run, either margins fall, spreading the benefit more evenly, or, more likely, new retailers enter the market and compete away the supernormal profits. Because retailers are then selling less, their unit costs are higher and there are no long-term benefits. This model is plausible though it is intended to cover only one aspect of quality improvement.

In horticulture the long run, the period in which a change in productive capacity is possible, in which all factors are variable, is much shorter than in most industries. Farmers may make permanent adjustments to the supply price of vegetables in one or two years so any supernormal profits made here are transitory.

With top fruit the horizon is somewhat longer. It may take two or three years of good prices to convince the innovators that there has been a real and substantial change in demand and that it pays them to plant new orchards. It may be another three years before the full impact of the increased planting is left. There is then likely to be an over-supply. Even with grubbing grants growers are reluctant to grub out an

orchard when they have invested so much in it. One can expect therefore that the introduction of a new variety which gets a premium price, like Golden Delicious (29) will result in a surplus for much of the life of the new orchards. The implication is that an increase in price due to an improvement in quality may not benefit the farmer at all in the long run, and consumers will get a variety they are not particularly fond of at an unprofitably low price. Any attempt to use the grading system to restrict supply by making it illegal to sell certain grades, for instance, will probably have much the same effect (this is discussed in some detail below).

It has long been accepted by economists that any price support system for producers must be accompanied by supply control if it is not to result in severe oversupply in the long run. The same applies to price improvements due to grading. Ingersent (161) stated, "The adoption of quality grading is unlikely to be of permanent benefit to producers unless grading is combined with controlled marketing to ensure that the market does not become overloaded with potatoes..."

Following the widespread adoption of premium grading, it might well become necessary to supplement these overall controls with some measure of control over the total supplies of potatoes in different grades which are simultaneously offered to the market."

Production and sorting methods can change and new sorting and handling equipment can be bought in the long run. Over a period of years the supply curve can be changed. One might expect that production techniques will change so that the classes most in demand can be produced more cheaply in the long run.

In the long run too, tastes change, and the optimum grading system at one time may be obsolete ten years later. "Long experience with market controls indicates that short -run gains can be obtained through grade -based, price differentiated marketing. However, nearly always, shifts in level, even if not in form, of demands and production responses over time have severely limited the long-run gains. There is neither theory nor experience whereby the long-run optimal grades or allocation can be specified" (3). "Perhaps the greatest difficulty is that individual grades are seldom static but are continually subject to structural variations due to changing technology, tastes, merchandising techniques and because realized or expected sales in given grades may lead to changes in preference, patterns" (138). "We would expect the market share of a specific brand to decay over time, with its relative price: quality level held constant, because the new products entering the market will have a more "relevant" quality mix. More generally we would expect an initial growth in market share rising to a maximum and then decaying" (159).

This change in consumer tastes has two implications. First, the grades must be constantly under revision if they are to be relevant and produce all the benefits claimed. Secondly, in the long term, the premium product may become accepted as the standard product and it will no longer get a premium price: Class I will become the norm instead of Class II and Class Extra will be the premium product.

COMPULSORY MINIMUM STANDARDS

It is not altogether clear what it was hoped to achieve by a compulsory minimum standard. I have never seen an official or unofficial statement of the aims of the scheme. It is sometimes stated “It will remove inferior produce that is upsetting the market”, “It will get rid of the poor growers and let the good growers get on with the job”, “It will remove the poor stuff from the market so that Class I gets the price it deserves”, “The consumer will be able to rely on good quality”. Rather than try and identify a set of aims from these ill-formulated and inconsistent statements, I shall examine the effects of the minimum standards.

Growers and technical horticulturists often argue that the minimum standards restrict supply and so put up prices, which is, they believe, desirable. I have never heard this argument put forward by government officials: Britain has always been opposed to the use of a grading system for restricting supply (174) and the EEC now recognizes that “the marketing of Class III products enables certain consumers with modest incomes to obtain supplies of these products” (105). If minimum standards are imposed some supply restriction is inevitable. Economists are opposed to such measures. “Sometimes the prohibition of the sale of poorer quality of a product may be used as a device to restrict supplies and to raise price.....This inherently restrictive device is the more insidious because it can be spuriously argued that the raising of standards is in the interests of consumers” (42).

Under EEC regulations it is illegal to display, offer for sale, sell, deliver or market fruits and vegetables that do not meet certain minimum standards. Sales of all qualities to industrial processing plants and direct from farmer to consumer are permitted (74). Some crops must reach at least Class I standard, some Class II, and some Class III. For some crops there is no minimum standard. I discuss here a product that is sorted into three grades, Class I, Class II and Class III, and which is clearly labelled, and I discuss what happens when the sale of Class III is forbidden. The logic, analysis and conclusions are identical for the three grade (Class Extra, Class I, Out of Grade), four grade and five grade (Class Extra, Class I, Class II, Class III and Out of Grade) situations laid down in the EEC regulations and it would be tedious to repeat the analysis for each situation.

It cannot be emphasized too much that this analysis applies to the present legislation and not to any changes that may come about in the future, the banning of Class III under (105) for instance. There are now compulsory minimum standards for 27 fruits and vegetables. For two-thirds of these the minimum is Class I or Class II. For one-third the minimum is Class III.

It must be assumed for the purposes of analysis that the minimum standards are enforced and that the result of their imposition has been to remove low quality from the market. In fact it is not clear either that there has been an improvement or that any improvement that has occurred has been due to these regulations.

Market Period³

In the market period the effect of the forbidding of the sale of Class III is to reduce the total supply and to change the price of the other grades by an amount which depends on the income elasticity of demand, the quantity in Class III, the elasticities of substitution between the classes, and the rate of substitution between each class and all other products. If the grades are relevant to consumers, the effect of changing the supply of Class III is different from the effect of a similar change in quantity spread over each grade. Only if the grades were completely irrelevant to the consumer would normal elasticities apply.

In the market period all consumers are necessarily worse off, because of the higher price of Classes I and II. Those whose optimum purchase was Class II, generally people in the low income groups, suffer most, as they have both to buy a less desirable grade, (their utility function is such that they would prefer to buy a cheaper product and spend their money elsewhere) and to pay a higher price, so social costs may arise. It cannot, therefore, be claimed that the people who used to buy Class III are better off because they get a better product.

The only possible benefit to the consumer from the imposition of a minimum standard is a reduction in the search cost. This would be of immense value if it referred to the consumers' health, -the safety of electrical apparatus or the hygiene of foods for instance -though a warning is considered sufficient for tobacco. When the product is clearly labelled or, as with fruit and vegetables, the quality is clearly visible to the consumer, there can be little reduction in search cost: indeed the higher price gives the consumer more incentive to search, so search costs may rise.

The requirement that the product should be substantially free from visible traces of fertilizers and pesticides is partly a safety measure, and in countries where there is no legislation on food additives a minimum standard may be necessary. It is instructive to compare the simple requirement of the EEC regulations with the analyses for invisible traces of fungicides and insecticides carried out by a Belgian supermarket group which specifies in its contracts with producers the maximum permitted toxic residues identifiable by chemical tests (167).

There is one situation in which the appearance does not give the consumer an indication of the eating quality, even though producers and distributors should be aware of the fact that the product is inferior. At the beginning of the apple season, very high prices are achieved, so growers try to get their apples on the market

³ This analysis closely follows that in (19) and (18).

as early as possible. The result is that immature apples of poor eating quality flood the market at the beginning of the season. Not only are consumers cheated, but also it can be argued that they acquire a suspicion of the quality of apples that reduces demand throughout the season. EEC regulation 1599/76 (99) lays down greater than usual minimum sizes for apples in the early part of the season, to discourage growers from picking immature fruit. This seems to be a valid and useful application of minimum standards.

If the minimum standard is irrelevant, the people who bought Class I and II pay a higher price for the same goods and those who previously bought Class III pay a higher price for a commodity that they do not consider any better. If any of the many attributes laid down in the specification of the minimum standards is irrelevant to any group of consumers they will suffer equally, in so far as some of the product discarded is no worse than what they are buying. The working classes in Britain and Italy are paying higher prices because the standards list attributes of interest only to the German or French professional classes.

When the sale of Class III is forbidden, individual retailers may get a higher or a lower revenue, depending on the cross-grade effect and their policy on margins. Those retailers who sold mainly Class III probably lose a lot of trade. Social costs arise if, for instance, they are small family shops or neighbourhood shops, or if, because they are forced out of business, local customers have to travel further for fruit and vegetables. For most shops fixed costs per item sold rise and there is little or no fall in variable costs. Procurement costs may fall (see above). Handling costs would fall if retailers only had to handle two grades instead of three, but, in practice, retailers only handle one or at the most two grades, however many are available on the market. Waste may fall, but it may not if stale or sub-standard Class I and II must be dumped rather than being marked Class III and being sold at a cut price. (On balance I would expect some reduction in waste. See (136) for the effect of selling stale produce at a reduced price). Retailers incur increased supervision costs.

If the result of the minimum standards is to reduce waste and if retailers continue to change their customary margin, it can be expected that retailers will reap all the benefits and producers will suffer (190).

Wholesalers sell less at a higher price. If they sell on commission, their gross revenue may increase or decrease, depending on cross-grade elasticities. If they buy and sell, their income depends on their market power as well. The individual wholesalers who sell mainly Class III will be worst affected. Fixed costs per unit of throughput increase. The wholesaler loses the flexibility gained from being able to sell over-mature Class I as Class III. It may take the wholesaler less time to sell the uniform Class I and Class II, than to sell the mixture of qualities that ends up in Class III and this may reduce his variable costs. Overcapacity leads to higher costs per unit sold. Administration costs also rise.

The total revenue to the producer may or may not rise when Class III is banned, depending on whether the increase in average price is greater than the fall in quantity. If a product has a uniform quality and an inelastic demand, a 10% reduction in supply will lead to a increase in price of more than 10% and total revenue to the producer will rise.

In the same way, in the three-grade model, a reduction in the supply of Class III could lead to an increase or a decrease in total revenue.

In the market period, where supply is perfectly inelastic, the changes would be due to the following:

1. The reduced supply of Class III increases the demand for its substitute, Class II, and so puts up its price.
2. The reduced supply of Class III increases the demand for its substitute, Class I.
3. The reduced supply of Class III puts up the demand for the category, “all other goods”.
4. Because the price of Class II has risen, some customers may choose to buy Class I or “all other goods” instead.
5. Because the price of Class I has risen, some customers may choose to buy Class II, or “all other goods” instead.

The equilibrium position is the resultant of all these forces and may give a higher or a lower total revenue.

Since no one has attempted to quantify the effect of farmers’ revenues of the banning of Class III, we do not know which result is more common. Nevertheless, it is possible to make a few general observations.

Class III items are less close substitutes for Class I than are Class II or other Class I items (assuming of course that the grading system is relevant to the consumers’ requirements). It follows that the effect on the price of Class I of a reduction in the supply of Class III would be less than the effect of a reduction in the supply of Class I. The elasticity of demand with respect to the supply of Class III would be more elastic than the elasticity of demand with respect to the supply of Class I or II, and would normally be more elastic than the demands for the product as a whole.

Indeed, if Class III is very much inferior to Class I, or if the two grades appeal to very different sectors of the community, the reduction in supply because of the banning of Class III will have little or no effect on the price of Class I. This would also be the case if consumers do not see Class I as a close competitor to Class III. They may see cabbage rather than Class III sprouts as the main competitor to Class I sprouts. They may see peppers rather than soft “frying tomatoes” as a close competitor to Class I tomatoes. In both cases growers clearly would be worse off as they would get much the same price for a smaller quantity sold. Consumers do not face the price rises that would otherwise occur, but they do suffer a loss in utility when some products are no longer available.

Waugh (29) shows that it is not necessarily the most profitable option to withdraw the lowest grade: in many cases the industry could gain more by withdrawing Class I or some from each class. The analysis above suggests that his model may be of fairly general application rather than being a theoretical curiosity.

Price (118) has shown that it can pay producers to restrict the supply of the lower quality even when

the demand for the product as a whole is elastic. His model assumes that an increase in the culling rate improves the quality of all grades, by removing the smaller cherries from all grades alike for instance, so that both the reduced supply and the improvement in quality of the existing classes increases the price. In the EEC system the supply of only one grade is affected, and the specifications of other grades are unchanged so this effect does not arise (except perhaps with EEC Regulation 1599/76 (99) which is discussed above).

It must be remembered that the elasticities and cross elasticities are not constant. They could be elastic at high prices and inelastic at low or vice versa. Elasticities could also be expected to vary over time. With these variations, the higher income to the farmer would be partly or completely counter-balanced by lower prices at another period.

Fixed and variable costs per unit sold increase, but the cost of packaging and transporting Class III is saved - an important point. It is probable that those firms that produce mainly Class I benefit and those that produce mostly Class III are worse off. Frequently it is the small family firms with very low incomes that produce Class III and are slow to change. If they are forced out of business by a minimum standard, the economic and social consequences are far reaching.

Short Run

In the short -run it may be expected that supplies will increase and prices will fall below the market period level, so consumers will not be as badly off as in the market period.

Retailers and wholesalers, particularly those who sold mainly Class III, sell less and may go out of business, so a smaller quantity is sold by fewer firms, which may lead to a rise or fall in turnover per firm. Those firms that received a premium for quality may get a lower premium as average quality rises.

Total supply is affected in several ways in the short run. Some of those producers who produce a large proportion of Class III switch to other products or go out of business, so the Class I and II they produced is no longer on the market. Other producers, especially those producing mainly Class I, use their capital at a greater intensity and produce more, at a higher marginal cost. Producers also have a greater incentive than before to change their techniques, producing more Class II and less Class III, as the return from improving an item from unsaleable to saleable is greater than the return from improving it from a saleable product to a better saleable product.

Without a great deal of knowledge about the supply function, which we do not have, we cannot predict the net effect of all these changes. It is quite likely that, in the short run, the Class I and II prices are higher than they were originally. However, there might be so much product raised from Class III to Class II that the Class II price, and then the Class I price fell below the original prices for these grades. This is particularly likely to happen for orchard crops, whose output is inelastic in the short run.

Some of the implications may be considered. If there were economies of scale to be obtained when producing Class I but not when producing three classes, minimum standards might reduce costs in the long run. In fact, the economies of scale are more likely to arise when producers sell their whole crop as Class III and avoid sorting and quality control. The economies of scale might be open only to large producers or co-operatives who could afford specialized equipment, so the minimum standard could be a means of structural reform, of forcing out small producers, and of introducing central marketing. However, direct methods are more likely to be effective in achieving these aims and are less likely to have harmful side effects.

It is sometimes argued that the chief reason for poor quality is bad management, and that firms will improve their production methods if Class III must be discarded. This is assumed to have little or no cost and in some crops better quality is associated with higher yield. The result one would expect is a large increase in the supply of Class II, bringing Class I and II prices below the original levels. This would benefit Class I and II consumers and some or even all Class III consumers, but it would make all growers worse off, particularly if they have increased their unit costs. High quality is not always associated with high yields. Thiault (26, 27) concludes that "compared with mass production based on maximum yields and a systematic attempt to reduce costs, the growing of fruit and vegetables of guaranteed quality leads to an increase in unit costs of production, partly because of the cutback in total output and partly because of the increased costs, not only of cultural operations in the orchard but also of storage and marketing." See also (142). In his discussion on quality standards Arthey emphasizes that "Allowances have to be made for failure to achieve perfection in horticultural crops, not necessarily because such a level cannot theoretically be reached, but because it would be uneconomic to do so" (125).

The fact that growers continue to produce Class III when they could apparently earn more by producing Class I, suggests that they do not think that the extra revenue compensates for the extra work and attention to detail required.

The poor quality may not be due to bad management. It may well suit the farmer to produce Class III and dispense with the sorting. He may not be willing to transfer the necessary labour from other, more profitable, crops.

The decision faced by the horticultural producer is extremely complex and it is virtually impossible for the producer to calculate his optimum sorting plan, though occasionally he may find a position that is clearly not far wrong. No outside observer could have any grounds for saying that the farmer is not adopting an economically optimal plan. Still less could anyone say that all farmers are mistaken in producing Class III.

One cannot therefore justify the intervention.

If poor quality is due to poor management, it is more cost effective to take direct steps to improve the management by extension and advice, both technical and economic, and by improving the marketing system, than by imposing minimum standards and hoping that the rest will follow.

Even if quality could be improved at no extra cost, one could not assume that it would be improved

just because minimum standards were introduced. Some producers go out of business or switch to other products rather than submit to what they consider to be mindless bureaucracy. Others find that the increased price and the reduced quantity give them the same income, so there is no incentive to change production methods.

Some people would claim that the minimum standards are intended to increase farmers' incomes by reducing the supply, though it must be emphasized that this is not the declared policy of the EEC nor, as far as I know, of any member state. If such a policy were to work

(a) The demand would have to be such that the reduction in the supply of Class III led to an increase in total revenue to the farming sector.

(b) Short-run or long-run supply control, by quotas or licensing for instance, would be necessary if increased production in the short run was not to bring farm profits down to the normal level (192, 161). As mentioned above, artificially increased prices for orchard crops are likely to lead to long-term structural instability.

In imposing a minimum standard the state must also allow for the market effect, which will affect the marginal return from sorting. It is sometimes argued that producers adjust their culling according to the demand curve facing the firm rather than to the market demand curve, and that they will obtain monopoly profits if a national minimum standard is introduced. The market effect has been discussed above.

The elasticities in the market period and short run are likely to lead to higher prices than will be maintained in the long run. In the long run consumers' tastes may change, so they no longer find Class III acceptable and Class II takes its place in their minds as the inferior product. The Class II prices may fall towards what was accepted as the Class III price. This phenomenon has occurred with a great many products in the past. With the present resource crisis it is morally wrong to force people to switch to products that require more resources to produce. Similarly, it is morally wrong to force the destruction of a perfectly edible cucumber, which is acceptable to the consumer, and which is produced with a large quantity of fossil fuels, merely because its appearance would not have appealed to a committee in the 1950s or 1940's or even the 1920's.

What Minimum Standards?

The impact of minimum standards depends largely on their specifications. It is most unlikely that category specifications that are optimal when three grades are marketed will also be optimal when the bottom grade is thrown away, because the following changes take place

(a) The elasticity of demand for each grade will change.

(b) The cross elasticities of demand between grades will change.

(c) The cross elasticities of demand between each of the grades and other alternative goods will change.

- (d) The absolute level of demand for each grade will change.
- (e) The short-run and long-run supply functions for each grade will change.
- (f) The cross elasticities of supply between the grades will also change.

Even if we had full and detailed information on the prices and quantities on the market before the minimum standard was introduced, we should not be able to forecast the supply and demand functions when one grade was removed. The difficulties are insoluble even if only one product is affected. Since the regulations affect 27 of the most important fruits and vegetables, every supply and demand function in horticulture has been affected, making prediction quite impossible.

Implications

It is theoretically and practically impossible to justify the imposition of a minimum standard for fruit and vegetables. The benefits are vague and insubstantial, difficult to conceive theoretically and more difficult to measure. They are uncertain, distant and small.

The costs, from a reduction in supply, are certain and are large in the market period, and probably in the short run. Many of the costs are glaringly obvious, some are less obvious and some are vague. The onus is therefore on the legislator to justify his action with facts, theory and hard analysis. This has not been attempted.

We can expect that a 1% fall in supply of horticultural products will lead to a greater than 1% rise in prices, as there is an inelastic demand for most fruit and vegetables (cauliflowers “other citrus fruit”, pears and bananas being the chief exceptions (153), and as the effect of reducing the supply of all fruit and vegetables at once would be even greater. If the amount of horticultural produce that is not acceptable to the consumer but does not meet minimum standards is only 10% (and it is much higher for many products) then the immediate effect of the imposition of minimum standards is an increase in prices of fruit and vegetables of well over 10%.

Since Britain spends over £1, 000 million a year on horticultural products directly affected by these standards, an immediate cost of over £100 million a year was incurred for no obvious benefit. The cost to the EEC as a whole would be proportionately higher, £500-1, 000 million a year, if the regulations were strictly enforced, which they are not.

The costs are incurred under the present legislation. Minimum standards exist for 27 products. For one quarter of these, Class III is the minimum standard. For two thirds of crops, even Class III is not permitted and for a few Class I is the minimum standard.

It has always been the aim of the EEC to abolish Class III eventually and so aggravate the situation. Under EEC regulation 1035/72 (74) it was to be illegal to sell Class III after 31 December 1977. The strength

of the arguments presented here has been recognized and EEC regulation 2764/77 of 5 December 1977 (105) extended the deadline to 31 December 1982. Unfortunately this regulation reform was too half hearted: there are still minimum standards for 27 products. If the regulation had not been passed and Class III was banned the public outcry might have led to the abolition of minimum standards.

PRICE STABILIZATION

One of the most common arguments put forward in favour of the EEC grades is that they make it possible to stabilize prices by forbidding the sale of one grade in times of oversupply and therefore stabilize prices. This argument is not put forward by administrators, who know that the EEC standards are not designed for this and it would be impractical to use them in this way, nor by economists nor by members of the trade.

Under Regulation (EEC) no. 1035/72 (74) it is possible for the Commission to permit exemptions from the obligation to conform to the quality standards; to permit the sale of Class III, if it is not normally permitted; to derogate from the standards, or, if a Class III has been defined but is not in operation, to adjust the minimum sizes permitted. These changes can only take place after

1. the Chairman refers the matter to the Committee.
2. the representative of the Commission submits a draft of the measures to be taken.
3. the Committee delivers its opinion on the measures within a time limit set by the Chairman.
- 4- the opinion is adopted by a majority of 43 votes.
5. the measures are communicated by the Commission to the Council if they are not in accordance with the opinion of the Committee, in which event the Commission may defer application of the measures for one month. There still remains the possibility that the Council may take a different decision within one month.

It is impossible to stabilize the highly volatile fruit and vegetable market if decisions can only be taken after such lengthy discussions. It is likely that the supply situation will have changed by the time the decision is made, in which case the derogation will have the effect of increasing the instability.

For this reason the use of the grading system by the EEC to stabilize the market is almost unknown. In November 1977 (Regulation (EEC) no. 2451/77) (104) was passed permitting the sales of Class III oranges, mandarins, etc. and apples of certain varieties until the end of the year, because of a short crop. There were strong criticisms from the trade that the November 1977 derogation, being made after the crop was picked, came too late to have any effect on supply.

Normally it is illegal to sell Class III of lemons, table grapes, cherries and strawberries but each year a derogation is approved and Class III can be sold for certain months (60, 73, 79, 83, 87, 97, 103). However, the relaxation is not in the off-season when supplies are imported and prices are high, but in the home season. The effect of the legislation is to destabilize supply.

It has been stated by officials who do not wish to be named that several EEC countries operate their

own systems of derogation, and observation tends to confirm this. The decision on which crops are in short supply is sometimes made at a formal meeting in the Ministry of Agriculture of the member state. Since the EEC does not permit these derogations, the inspectors do not announce their intention of relaxing their standards. This means that growers cannot adjust their sorting procedures accordingly and the effect on supply is small. If the relaxation lasts some months, growers will respond. Consumers and distributors then notice that the quality of Class II or III (whichever is the bottom grade) fluctuates and they lose confidence in grades as a description.

If it is intended that the derogation should smooth out fluctuations in supply it is better that supply should be adjusted gradually, by adjusting size standards for example. The addition of an extra class may add 15% or more to the supply, and so have a marked effect on prices. Unfortunately the best system for stabilizing prices is far from the best system for preserving consumers' confidence in grades as a method of description. It is also contrary to the spirit and the letter of EEC regulations, causing distortion in international trade.

Is Price Stabilization Desirable?

It has been shown that price stabilization by adjusting the EEC grading standards is impractical and that the system of unofficial derogations used by national governments have serious weaknesses. Should the regulations be changed to permit the use of derogations to stabilize prices?

The system would be a system of compulsory minimum standards, with the standards applied only for part of the year or with different standards applying at different times of the year. The analysis of compulsory minimum standards applies here and the conclusions are the same. The system of restricting supply at some times of the year imposes high and immediate costs on all sections of the community and the benefits are ill defined, uncertain, distant and, in all probability, small. The costs and benefits are reduced by the fact that the minimum standards are not always in operation.

The argument for increasing the supply in times of scarcity is the same as the argument for abolishing minimum standards completely. Broadly speaking, if it is acceptable to increase supply in times of scarcity, it is acceptable to abolish minimum standards at all times of the year.

Other costs are also incurred in stabilizing heavy administrative costs, advertising, charges to the producer and the public, loss of confidence in the grades etc. There is a danger of causing structural oversupply by artificially reducing risk and increasing average price.

Prices perform an essential function in a market economy. For example, if high prices are paid at times of scarcity, growers are encouraged to produce then. In equilibrium the price premium will be just sufficient to get the marginal grower to produce out of season. If prices are stabilized, with Class III being forbidden in times of high supply and with all qualities being permitted in times of scarcity, the premium for

out-of-season production will fall and there will be a reduction in out of season production until the premium is again big enough to attract a marginal producer. For example the premium for early celery must be high enough to cover the increased costs and risks if growers are not all to switch to maincrop -celery. The effect of price stabilization is to destabilize supply.

It is a truism of agricultural economics that supply stabilization frequently destabilizes income. Non-economists often talk as though price stabilization was identical to income stabilization.

Any attempt to use a grading system as a tool for obtaining monopoly profits, for stabilizing prices or for intervention must seriously weaken its effectiveness as a marketing tool.

Storage

The theoretical justifications for stabilization found in the literature are usually based on abstract models of a homogeneous commodity which can be stored indefinitely without deterioration and at no cost. Obviously if one removes some of the supply at periods of low prices and puts it back on the market at periods of high price most of the costs will be offset by benefits, and the net result will be by no means as clear cut as with minimum standards for example.

With horticulture none of these assumptions apply. Few horticultural crops can be stored for any length of time so goods withdrawn from the market must be dumped. Some crops can be stored, but the storage space is normally earmarked for commercial storage. Producers will fill their stores at times of low price anyway, so none of the crop that is withdrawn can be put into the store without displacing produce that is already in store and so nullifying the effect. In fact, since the produce is not homogeneous, the Class III that has been withdrawn will be going into the store and displacing an equal quantity of Class I. Because Class I is a closer substitute to the product left on the market, this means that the average price for the Class I and II will be less than it would have been had the market remained undisturbed. It is normal to store only the high grades, as the cost of storage (even the marginal cost) amounts to too high a proportion of the selling price of the lower grade, but the market stabilization policy would force growers to adopt the uneconomic policy of storing the lowest grade. (One can imagine supply and demand functions such that it would pay the industry, but not the individual, to store Class III. It is unlikely that the necessary conditions would apply in a real market). It must be concluded that the storage argument is not valid for horticulture.

The Two-Sector Model

In Britain one sector, greengrocers and grocers, gets most of its supplies from the wholesale market, paying the going free market price for it. Supermarkets, the other sector, buy vegetables and some fruit direct from growers, prepackers or importers with whom they have contracts or gentlemen's agreements. They attempt to

stabilize the prices, so that there are few price changes in any one year, though suppliers may expect to get at least as high an average price over the year as they would in the wholesale market. The situation is similar in several other EEC countries. A detailed model of this two -sector market is set out by Bowbrick (195). It can be shown that under these circumstances:

1. Greengrocers' prices are higher and supermarket prices are lower at low levels of output than they would otherwise be. At high levels of output supermarket prices are higher and greengrocers' prices are lower than they would otherwise be.
2. The average revenue curve of the contract farmers is more elastic than the average revenue curve of the non-contract growers.

This implies that prices will fluctuate more in the wholesale market as a result of the direct buying system.

The supermarket chains tend to buy top quality produce, so contract growers sell their Class II and III on the wholesale market. The wholesale market can dispose of this to the grocers and greengrocers who are less demanding and to the institutional buyers. If there is any attempt to stabilize prices by banning the bottom grade, then all the effect will be felt in the wholesale market under this model, and the effect will be intensified there. If, for instance, supermarkets have half the trade and 15% of produce is in the bottom grade, banning the bottom grade will reduce supply on the wholesale market by 30%, but will not affect supply to the supermarket. The contract growers, who produce large quantities of top quality produce, suffer a loss in revenue, but do not get a compensating increase in price. Other growers, who produce smaller quantities of mixed grades, probably benefit in spite of elastic cross -elasticity of demand. (The supply of only one crop at a time is being changed).

This conclusion would apply in times of heavy supply but in times of glut prepackers usually have to dump their Class III, both because it is a poor Class III, all the Class I and II having been removed, and because wholesalers give preference to growers who send them their whole crop throughout the year.

The effect of the price stabilization policy is to reduce the incentive to those growers who are doing something concrete to remove the causes of price fluctuations, by building stores or by long and short term planning of production with the retailer, to ensure continuous supplies.

A case might be made for stabilization by restricting supply when there is a glut, not just an unusually large supply, and demand is inelastic. If nothing is done in this case part of the crop will be dumped, as a fall in the price will not increase sales enough to clear the crop. This problem is often aggravated by retailers not bringing down their prices by the same percentage, either because they have a minimum absolute mark up or because they wish to profit from the inelastic demand by restricting supply. Stabilization increases returns to the grower, and may have little effect on consumer prices in the short run. In the long run, stabilization may keep more growers producing, and reduce the risk of absolute disaster, so more will be produced at a lower price. In a glut, though, prices are typically below the harvesting, packing and transport costs, and much of the crop is ploughed in. If growers must instead harvest the crop, sort it and dump Class III, additional costs

are incurred, and average returns per acre may be no higher. The case would have to be argued on actual elasticities of supply and demand for the crop. Intervention would seem to be the appropriate way of dealing with this.

Risk

It may be argued that price stabilization reduces risks and so reduces costs. The argument is not valid in relation to most horticultural commodities. Risks may be considered in terms of within season fluctuations and of year-to-year fluctuations in returns.

It should be made clear at the start that risks do not necessarily imply costs. Many horticultural producers enjoy the gambling aspect, of pitting their wits against the market. Farmers who have low-risk combination of enterprises that gives them an adequate income often take on a high-risk horticultural crop as a gamble.

Some crops like apples have a single harvest and others like tomatoes or brussels sprouts are harvested over a long period. There is not much point in taking administrative action to smooth out the gluts and shortages during a season, as the market mechanism does it successfully. What is more, the low price in one week is often compensated for by a high price in the next. Growers are interested in the average price over the season, not in occasional fluctuations. For this reason many cauliflower and lettuce growers produce crops maturing in succession over several months knowing that they may lose money for a month or two, but believing that they will make money over a year.

It is doubtful whether it is practicable to control the supplies of crops like lettuce, because of the rapid changes in demand with changes in the weather and because of the fluctuations in supply and demand over the season. Even for those crops for which supply and demand is steady, it is doubtful whether administrative action could be very effective in stabilizing prices without masking price signals.

Growers may switch from high risk products for which there is a great demand to low risk products for which demand is lower, if risk in one group of products is reduced. This causes a sub-optimal allocation of resources. Year to year price stabilization is not much more promising. In most cases income will be stabilized fairly effectively by a three-year moving average tax system.

Vegetable producers tend to produce a range of vegetables and over a year the high returns of one tend to compensate for low returns for another so fluctuations in total revenue from vegetable crops from year to year are surprisingly small (196, 197).

Year to year fluctuations in price can be more important when a single crop is the main or only enterprise on the farm as with apples or tomatoes. One or two bad years before the business is established can have a serious effect on the viability of the business.

Intervention

An EEC intervention system has been established for some of the more important crops and it should be used rather than any ad hoc juggling with grading standards. There are several advantages of intervention.

It is obvious to everyone that intervention implies a cost. When £50 million are coming out of EEC funds for intervention, care is taken to see that the conditions for intervention do exist and that the regulations are adhered to. If the grading system is tampered with, the costs are as high but they are borne by the grower, the housewife and the distributor, not the exchequer, so they are frequently ignored. (This is not to say that the costs to the exchequer are the sole cost of intervention).

The intervention system is designed to achieve a specific purpose, with a minimum of distortions. The grading system can have several contradictory aims, and if it is used to achieve one aim it will make another impossible to achieve and will distort the market.

The method and purpose of intervention is clear to everybody. The aims of the grading system are so confused and contradictory that no one is ever quite sure what a given action is intended to achieve. Indeed the intellectually dishonest avoid answering any criticisms, by just ignoring the proof that the system cannot achieve certain aims, and saying that the system still has so many other desirable effects that it should continue unchanged.

Conclusion

The use of the EEC grading system for price stabilization is quite unjustifiable. The system is not designed for this and it has proved impossible in practice to use it for stabilization.

When used for stabilization the system is a compulsory minimum standards system for some times of the year and the conclusions of the section on compulsory minimum standards would apply. In the market period consumers would be worse off but under some market conditions producers would be better off.

The system would destabilize the market in the long run. Growers would have less incentive to stabilize their output so supplies would fluctuate more. Supply stabilization does not necessarily reduce risk and a reduction in risk is not necessarily desirable.

A purpose-built intervention system is more likely to be satisfactory in stabilizing revenue than is a grading system designed with other purpose in mind.

The use of the EEC grading system for price stabilization is impractical and any practical system is illegal.

ADMINISTRATION COSTS

Governments and the EEC Commission must negotiate standards, legislate, inform the users of the new regulations, provide inspectors at producer, wholesale and retail levels, warn offenders and prosecute persistent offenders.

These costs are negligible in relation to the costs incurred by the horticultural industry, though they may be a significant part of the administrative expenses of the Department of Agriculture of the member states.

THE EEC GRADES AND FOREIGN TRADE

Buying on Description

There are clear savings in time and money if an importer can telephone another country and order 20 tonnes of Golden Delicious, secure in the knowledge that the product will come up to specification. It is difficult to imagine international trade working satisfactorily without clearly defined grading specifications.

One must ask though whether it is necessary to have one single grading specification for all products from all sources, and whether grading should be compulsory.

The theoretical advantages of buying on description do not depend on there being one unique system operating in all exporting countries. In fact the system may be more effective if each country adopts the grading system best suited to the qualities of the product it produces. Even if it was felt to be necessary to have one universal system, the Economic Commission for Europe grades (which are very similar to EEC grades) could always be used for description even if there was no EEC grading system.

International trade in fruit and vegetable has been conducted for centuries without the aid of EEC or OECD standard grades. Indeed the most successful and largest export businesses, in bananas, oranges and southern hemisphere apples, were built up before the EEC regulations were thought of. The grading standards used by most marketing boards and other major exporters have tighter specifications than the EEC standards, and these specifications are strictly enforced, so the EEC standards are irrelevant. The major exporters also make a point of providing a great deal of commercial information not required by EEC standards. The export trade can only exist in an atmosphere of mutual trust and both buyers and sellers accept that deception cannot benefit them in the long run.

The growing literature on the economics of crime, (e.g. 199) makes it clear that even if everybody in the business was totally without scruples, it would pay them to have a certain reputation for honest business practices, and that it is not in someone's interest to get a reputation for fraud, by consistently overstating the grade for instance. Bauer and Yamey make a similar point (42) and the importance of mutual trust is emphasized by everyone writing on the direct sales channel. Heal says that it only pays traders to deliver poorer quality than ordered if they are very short-sighted, discounting future benefits at a high rate (200).

Importers have a pretty good idea of what quality to expect when they buy tomatoes from Holland, Guernsey or the Canary Islands. The quality is not the same from each source but importers have a good idea of what quality is acceptable to Guernsey's quality control service.

In practice the member states derogate from EEC standards on the home market when the market is undersupplied, so the countries may have different regulations at anyone time. If country A relaxes Class II standards, exporters in country B may find it difficult to compete. Their exports must pass quality checks, at the official standards, before leaving. In the export market, country B's real Class II is competing with country A's derogated Class II. If buyers buy on description, the price of the real and the derogated Class II is the same.

The interpretation of the EEC grades varies from country to country. British growers who have exported cauliflowers to France have found that the English Class I cauliflowers were downgraded to Class II because the French like cauliflowers to be open. Open cauliflowers were Class II in England and Class I in France (201). One cannot criticize these different regional interpretations of the grades as they result in the consumer getting what she wants and in the producer getting a price that is appropriately high: in fact the varied interpretation gives a marketing system that is more economically efficient.

If the importing wholesaler buys from a regular supplier he knows what to expect in the way of quality. If the quality is not up to the expected standard he will inform his supplier and make adjustments in the normal commercial way - this is particularly easy if the exporter has a depot in the importing country. Regular exporters value their reputation for quality and fair dealing and will not lightly argue.

If the wholesaler is selling on commission for the exporter, the exporter takes any loss from poor quality or grading. In these circumstances exporters rapidly learn the market requirements - the English cauliflower growers, for example, did not make the same mistake twice. -

One can visualize circumstances in which it would be of great value to an importer or exporter to have a universally accepted standard, rigidly enforced, so that buying and selling would be done on description. This would be particularly important when the importer buys from an unknown foreign sender.

It should not be thought therefore that the EEC regulations are essential for buying on description, nor that the present specifications are necessarily ideal for the purpose. While they are convenient to some people for some transactions, there is no justification for making them compulsory for all transactions. In particular there is no strong case for having identical standards in all EEC countries, a point which is most important, as it has been shown in previous sections that the application of uniform regulations to a heterogeneous population seriously reduces the value of grading.

Foreign Trade and Minimum Standards

The application of EEC minimum standards regulations within a country can increase the level of imports. The regulations forbid the sale of anything below Class I for some crops, Class II or III for others. For simplicity we will take the crops for which Class III is forbidden -the argument is the same for the other crops.

It is generally uneconomic to export low-quality goods as they have to bear the same transport and packaging costs as the best goods, and a relatively high proportion of the total selling price goes on these expenses. For this reason, exporting countries usually consume Class II and II at home and export Class I.

If there is no minimum standard the importing country can sell Class I, II and III and a quantity of Class I will be imported. If the sale of Class III is then prohibited, supply on the market falls and the price of Class I and II rises. The rise in the price makes importing more profitable and imports rise. This increases imports above the free market level.

Farmers do not benefit from this. If there is an elastic supply on the world market, which is true in the short run for most commodities and in the market period for others, the price for Class I does not rise at all. There may be some small shift, upwards or downwards, in the price of Class II. Farmers sell a smaller quantity at the same price.

The farmers could not be expected to benefit even if there were a rise in the price as might be expected in the short run with plantation crops - a three or four year delay before the orchards started to bear. There would be some increase in imports from existing orchards and Class III and I are imperfect substitutes so a 10% reduction in the home supply is likely to increase average price by less than 10% so reducing returns per acre.

This helps explain how foreign exporters can compete against EEC producers in spite of soaring transport costs. The exporting country has low unit costs because it sells all grades, selling the Class III and IV at home, while the importing country sells only Class I and II. It may also use discriminating monopoly, allocating supplies between home and export markets in such a way that home consumers (who have an inelastic demand) pay a high price and so subsidize exports. Exporters have of course other advantages such as highly organized distribution systems which move produce cheaply and efficiently. They often practice discriminating monopoly in their allocation of supplies: between European countries or even between the different markets of Britain. Favourable climate and cheap labour may also be important.

A similar argument can be used to show that the minimum standards make it harder for fresh fruit and vegetables to compete with more expensive frozen fruit and vegetables. As the price of fresh vegetables rises, frozen foods become a closer substitute.

It is sometimes argued that home -produced produce must be graded to the same standards as imported produce, otherwise buyers will lose confidence in the home -grown product. For instance, it is argued that the large quantity of Class II Irish apples on the market depresses the price of Class I Irish apples relative to imported Class I, even though all apples are correctly labelled: if Class III or IV were available the effect would be greater. There may be such an effect but it is impossible to confirm that it exists, much less to quantify it.

The home-produced Class I is a different product to the imported Class I for the following reasons:

- (i) The imported product is branded (with country of origin if nothing else).
- (ii) The imported product is frequently or even generally sorted to higher standards or lower tolerances than the home product, even if both are marked Class I.
- (iii) The imported product may be heavily advertised.
- (iv) Exporters can offer a large supply of consistently graded produce over a long period. Only large groups and co-operatives can do the same on the home market.

In addition the home-produced product may get a lower price both because it is inferior or perceived as inferior and because: -

- (i) The imported product is backed by an efficient marketing service. (ii) Discriminating monopoly may be used.
- (iii) Wholesalers may use a variety of tactics to push the sales of imported produce rather than home produced produce (20, 21). They are particularly likely to do this when they have bought firm or when they are panellists for the exporter.

Even if it is possible to demonstrate that the imported product is getting a premium price, it cannot be assumed that this results in a lower price for home producers. Economic theory suggests that total demand increases as the range of qualities and brands on the market increases. Each new slightly different quality available will appeal to some people so much that they buy more of the new quality than they did of the old. Increased sales of imported produce may have surprisingly little effect on sales of home produce. Research has shown for instance, that Irish and French Golden Delicious apples are not seen as close competitors in the Irish market (148), so a small quantity of imports may have no effect on the price of Irish apples. If the increased price for imported produce results in increased imports, then of course the price for home products falls, but by considerably less than the difference in price between the two. Again, it is not the price but the total revenue that concerns the farmer.

Furthermore, even if it is demonstrated that the imported product is getting a premium price, it is impossible to demonstrate that this is due to Class III being available on the home market. It might as easily be due to the availability of Class II.

It is important that no remedial action should be taken which costs the home producer more than it saves. For example, one sure way of removing the premium is to adopt the same sorting, marketing and advertising as the exporting country and to ban the sale of anything but Class I. The home producers would have to bear increased sorting, marketing and advertising costs, they would sell a much-reduced quantity. The price for Class I would hardly change, if the world market supply is elastic and imports would increase substantially, to fill the gap. Returns per acre would be much lower.

It is concluded therefore that:

- (i) Compulsory minimum standards reduce the competitiveness of the home producer and increase imports.
- (ii) Consumers do not benefit from compulsory minimum standards and it is doubtful whether producers in the importing country do.
- (iii) It is possible that, because only Class I is imported and a range of classes is produced locally, imported produce gets a good reputation and a premium price.
- (iv) It is virtually impossible to demonstrate this, much less to quantify the price difference.
- (v) It is likely that even if this effect did exist it would have little effect on farmers' total returns.
- (vi) It is likely that the cure suggested - a minimum standard - would be worse than the problem.

The Effect of Export Restrictions

Under EEC Regulation 1035/72, exports to third countries must be of Class II or above, though derogations are permitted. This regulation is directly relevant to countries like France or Germany which face competition from neighbouring non-EEC countries, and indirectly relevant to other EEC countries whose foreign trade may be affected by disturbances on these markets.

An inspector of the exporting country must examine exports from one EEC country to another, and inspectors should give priority to inspecting exports rather than goods sold locally (62). This inspection appears to be scrupulously enforced when MCA'S are available, though evasion and smuggling may occur otherwise.

The definitive economic analysis of the effect of compulsory minimum standards for export is that of Bauer and Yamey (42) which examines the arguments in favour in detail and refutes them crushingly, concluding "The prohibition of the export of inferior, but commercially marketable, qualities of produce necessarily brings about one or more of three kinds of result which adversely affect the interests of producers and of the economy as a whole. Such measures either (1) frustrate the export of substandard output already produced, (2) induce the economic expenditure of additional resources, or (3) deflect production into less valuable activities. These individual effects and possible combinations of them exhaust the possible economic consequences of these measures when applied to most export products" (42).

It is only possible to give a brief summary of their analysis here. First, producers do produce goods which are saleable but do not meet the minimum standards and there is an economic loss, both to producers and to the economy, if it cannot be exported (See also 142). Second, producers may attempt to raise the standard, in order to be able to export. They incur extra costs in doing so, which are not fully covered by the extra return, so an economic loss is incurred. Third, some producers decide to switch to another product, rather than face the risks and restrictions of a minimum standard. This necessarily is less profitable to them and the economy. The cost of administering the minimum standards is substantial (though small in relation to

other costs).

“The insistence on minimum standards and the obvious pride of some marketing authorities in the improvement of quality of export produce exemplify the confusion of technical and economic efficiency” (42). To insist that all motor car exports met the technical standards of a Rolls Royce would improve the quality of exports, but would destroy the export market.

They consider that grading can be a very useful marketing device, and that this is why grading systems have been developed in the world market. Indeed, even in the absence of a recognized grading system it is in the interests of both importer and exporter to have an agreement, tacit or explicit, on the quality that is to be delivered. “However such systems of grading are voluntary; transactions in ungraded produce or in produce below the standard of the lowest recognized grades take place if it suits the parties concerned” (42).

They do recognize the “infant-industry” argument for fruit, that grades and quality must be imposed to develop a brand name. This would be in the economic interests of the producer if he could still sell lower qualities unbranded. They point out the dangers that the expenditure on advertising will be excessive where it is financed out of a levy. “Further, where substantial merchants or producer co-operatives operate in the export trade, the case for government action is weak”.

This analysis applies in its entirety to the requirement that all exports from the EEC should reach Class II or above. The regulation reduces the growers’ return and imposes costs on the EEC but it does not confer any benefits. If growers could export Class III and out-of-grade produce, they would get higher returns and would not affect the home market.

One may consider too the case where the market prefers ungraded produce to graded. For example, it pays Irish prepackers to import French apples in bulk bins, as picked, and to sort them in Ireland. This saves heavy handling, packaging and sorting costs in France and adds little to the Irish prepacker’s costs - he would have to sort the apples on the prepacking line even if the apples arrived in the normal box. The result is that an export trade has grown up which might not be profitable if the EEC regulations were strictly enforced. The consumer gets a product that is at least as good.

The case against the regulations as they affect individual countries is the same. It may be argued though that a single country selling on the EEC market or in the world market is in much the same position as the individual grower in the home market. Often it pays the individual to have strict standards and to enforce them rigorously in order to build up a reputation and to get a premium price. At national level the same may apply; it takes only a few Irish growers selling badly graded or mislabelled tomatoes on the British market to give a bad name to all Irish exports, as the British wholesaler cannot be expected to know as much about the different Irish growers as the Irish wholesalers and retailers do. Similarly, poorly graded and labelled French cauliflowers could give a bad name to French apples or artichokes.

This should not be seen as an argument in favour of minimum standards. It is a strong argument in favour of having accurate labelling and for having a system of inspectors to ensure that grade labels are

correct. The argument applies most strongly when the product is sold under a national brand such as “Guernsey”, “Dutch”, or “Maroc”, as wholesalers might think that any product from that country carried the same guarantee of quality (though wholesalers are not noted for their naivety). When producer groups have established their own brand image for a brand that does not indicate its place of origin, the argument falls away.

Generally then minimum standards for export cannot be justified, though enforcement of accurate labelling may be. I believe though that a case can sometimes be made for having compulsory minimum standards for export, and I should not be surprised if Irish or Guernsey tomato exporters made a case for instance. However, cases where Bauer or Yamey’s analysis does not apply are rare, so minimum standards should not be imposed until a strong case has been made, supported by economic analysis, facts and figures.

Minimum Standards for Imports

Under EEC Regulation 1035/72, Article 11, (74), imports from third countries must be of Class II or above. No derogations are permitted, though imports from countries other than Europe and the Mediterranean area do not have to conform strictly to the marking regulation (Article 9).

Britain and Ireland import large quantities of tomatoes from the Canary Islands. These generally do not meet Class II standards (though air transport has led to an improvement in quality of a proportion of the imports) and it is accepted that the retailer may have to discard up to 50% of the tomatoes purchased. The retailers can select the best tomatoes and sell them cheaply at a time when home-produced tomatoes are extortionately expensive and when it takes a lot of oil to produce them. This undoubtedly benefits consumers and, in spite of some pressure from growers, Department of Agriculture officials have not enforced Article II, evidently believing that the reaction from consumers would not be politically acceptable. It might be argued that these imports do not seriously affect the market for home grown tomatoes as those consumers who are willing to pay very high prices for top quality, home produced tomatoes and those who would buy soft, Canary Island tomatoes are two independent sectors of the market.

Again, a case can be made for importing unsorted or Class III products for special purposes, for example, apples in orchard boxes to be sorted and packed by the importer.

I have not seen a statement of the arguments in favour of a minimum standard for imports so I consider here some arguments that could be put forward. If there is a compulsory minimum standard designed to increase growers’ price by restricting the supply of Class III, then it is undesirable that exporters should be able to nullify the price increase by filling in the gap with Class III. This argument is valid when (a) the compulsory minimum standard would have the desired effect (b) the foreign country would incur little transport cost, and (c) the world market supply for other grades is highly inelastic. In view of the comments above on “foreign trade and minimum standards” it seems unlikely that these conditions would hold.

The foreign country might not permit the sale of Class III at home but might permit its export, in which case their producers would be pleased at any price that covered the marketing cost, and dumping might occur. The EEC does have mechanisms for preventing such dumping.

An argument in favour of minimum standards for export is that the sale of inferior goods abroad damages the reputation of the exporting country. By this argument (which has been analysed above), minimum standards for imports protect the interests of the third country against the EEC's.

We must conclude that no convincing reason has been shown for minimum import standards. Even if it had been there would be a strong argument for permitting derogations by the member state involved.

It is possible that these imports could upset EEC trade. For instance the import of Canary tomatoes could upset the market for Dutch tomatoes (though in the past the quality has been very different). In practice, the problem is one of the total volume of imports affecting price, rather than of the quality of imports reducing the price.

Reference Prices

Reference prices are established under EEC Regulation 2454/72 (76). These prices are used for intervention, for calculating the entry price and for export refunds. These prices are based on reported prices for Class I and Class II.

It is in the interests of everybody that these prices are meaningful, and the figures will be most meaningful if the grade specifications are based on careful market research into consumer preferences.

It does not seem necessary that the use of EEC grades should be compulsory. The economics of information suggests that grade prices are more likely to reflect demand if a substantial proportion of customers ignore them and inspect - "keeping the market honest" (187). It might, of course, be necessary to change the weighting given to the prices, having the buying-in price at 50% of the basic price instead of 40% perhaps.

Intervention prices could be based on optional EEC standards and, of course, might only be paid on products graded according to these standards. The system would still have its faults, but it would be better than the existing system.

Even if it was administratively more convenient to base the reference prices on the prices for compulsory EEC grades, it could not be justified. The prices have a very small effect on a very small proportion of a handful of commodities. The grades have a major effect on all horticultural products, directly or indirectly.

It is perhaps unnecessary to add that the various intervention, export subsidy and import restriction measures are not universally admired. It may be argued that they are not the best, cheapest or most effective

methods of achieving their objectives or even that their objectives are the wrong ones. The arguments need not be discussed here: it is enough to say that if compulsory grades are only to be justified on the grounds of convenience in administering these schemes, then the balance of the argument shifts towards abolishing intervention, export sub subsidies and import restrictions.

Conclusion: Buying on description

1. Buying on description with EEC standards is not easy, as individual EEC countries derogate from standards or interpret them differently.
2. International trade has been and is carried on satisfactorily without standardized EEC grades. Export organizations generally use their own, more closely specified, grades and they give commercial information in addition to that required by the EEC.

Foreign trade and the minimum standards

Compulsory minimum standards on the home market reduce the competitiveness of the home producer and increase imports.

Consumers do not benefit from minimum standards and it is doubtful whether producers do.

It is possible that, because only Class I is imported and a range of classes is produced locally, imported produce gets a good reputation and a premium price. However, it is virtually impossible to prove that this is so, much less to quantify the price difference. It is likely that even if this effect did exist it would have little effect on farmers' total returns. The cure sometimes suggested - the same standard as the competitors' - would be worse than the problem.

The effect of export restrictions

If there is no control of the quality of exports, a country may get a poor reputation for quality in the export market. Accurate labelling should be enforced. Minimum standards should only be permitted in exceptional circumstances.

Minimum standards for imports

There is no convincing case for limiting the imports of some grades. There are times when it is clearly in the

consumers' interest to import Class III or below, and where it has little adverse effect on producers.

COMPULSION

It is generally agreed that if it is in the financial interest of producers and distributors to use a grading system they will do so. By and large they are extremely shrewd businessmen and will not miss an opportunity to cut their costs or increase their returns. If the system is relevant to their needs and the specifications are appropriate they will use the system. As Kohls (111) says, "Probably the best practical test of the adequacy of standards is their acceptance and use by the various marketing agencies. If the grading standard is widely used, it is probable that the standards are fairly adequate and economically meaningful. However, if large segments of the trade do not use the standards then it may be assumed that some of the criteria are not adequately met"

Normally, therefore, there can be no justification for compelling people to adopt a grading system. It will probably be necessary to have inspectors to ensure that anyone who does use the system uses it properly. It may be necessary to advertise the advantages of a system.

The only cases when it might seem desirable to compel adherence to a grading system are:

1. When public health is at risk.
2. When there is a danger of fraud.
3. When the producers (or wholesalers or retailers or consumers) are too stupid to know what is good for them.
4. When the people who have to take the action are not the people who benefit from it.

With fruit and vegetables there is no public health risk that cannot be managed by the normal public health regulations. The EEC regulations are not drawn up with public health in mind.

There is no danger of fraud at retail as the consumer can see what she is getting. At wholesale there seems to be little more danger of fraud with one grading system than with several. If there were more danger of fraud when using grades other than the EEC grades, the market would pay less for these other grades. If accurate labelling is enforced, but labelling is optional, there is very little opportunity for fraud. Habitual purchasing strategies by buyers make fraud unattractive to sellers.

It would be presumptuous to assume that one knew more than a retailer, a wholesaler or a farmer about how he should manage his affairs, without first examining his business. In the case of grading, where it

is extremely difficult to determine the optimum grading strategy of a single producer, even if adequate data are available, nobody who knew the first thing about the economics of grading would recommend a single grading strategy to thousands of heterogeneous producers whose businesses have not been looked at.

One argument is that the people who incur the costs of grading are not the people who benefit from it and that they must be compelled to grade in the public interest. This argument can only be valid if the following statements are true:

1. The people who do the grading or labelling get so few benefits from grading that it does not pay them to grade.
2. The people who benefit from the grading are not willing to pay extra for the service. This implies that they are stupid, that the benefits are masked by the market effect or that the price system is not transmitting their preferences to the man who does the grading.
3. These benefits arise if one single grading scheme, the existing EEC system, exists in all EEC countries, but would not arise if each member state had a slightly different system or if two or more systems were running in parallel.

If these statements are true most of the benefits claimed for the EEC grading system do not arise - producers do not get a better price from grading, wholesalers do not reduce their handling and procurement costs for instance - so the EEC grading system cannot be justified. If they are not true, then the EEC grading system should not be compulsory. It is not always true of course that a grading system that is effective is not compatible with a grading system that is compulsory. However, one cannot logically claim both that the scheme should be compulsory and that it has so many advantages that people will adopt it even if it is not compulsory. On the evidence available there is no reason to suppose that the system should be compulsory.

The EEC does not require this “total harmonization” with mandatory compliance for all goods covered by community regulations (217). More common are the following: -

- (i) Goods Harmonization. This applies only to the nature of the final product. Compliance is optional in local and national markets. Standards may apply only to cross-border trade. Local differentiation is preserved.
- (ii) Process Harmonization. This applies to inputs, processes and inspections. Compliance is mandatory and applies to all marketing conditions, but local differentiation is applied within limits.
- (iii) Labelling Harmonization. This applies to packaging and quality designations. Compliance is mandatory. Local differentiation is preserved with respect to vernacular requirements.

McCarthy (217) concludes, “that the interests of consumers must be considered the major factor underlying the resistance to product harmonization in the EEC. As a general rule, this would imply that attacks upon the EEC for failure to reduce or eliminate technical non-tariff barriers to trade by accusing it or

the member states of maintaining protectionism would appear to be misdirected”.

DATA PROBLEMS

The practical problems of assessing how successful the EEC grading system is in achieving its aim are insurmountable. It is impossible to obtain the information that would be necessary to justify the imposition of the regulations. It is possible, however, to make a rough guess at the costs, largely because most are incurred immediately while any benefits are distant, difficult to conceive of and uncertain.

Calculation Problems

If we were talking of a homogeneous product, the elasticity of demand would be crucial to any quantification. Here we must consider instead the cross-grade elasticity, the fact that a change in the supply of Class III affects the price of Class I and II and well as Class III.

Calculation of all the elasticities and cross elasticities is impractical. A very simple demand relationship might be

$$P1 - a - b q1 - cP2 - sP3 - cM \quad P2 = f - g q2 - hP1 - iP3 - kM \quad P3 = 1 - m q3 - nP1 - oP2 - rM$$

Where P1 is the price of Class I

q1 is the quantity of Class I

M is the price of the alternative product.

It is not feasible to get the data required to fit figures to these equations, either using experimental techniques or using econometric analysis of historic data. The data required for a more realistic model are quite unobtainable.

Solving the equations would require a very large number of observations because of the number of variables. An econometric study of fruit and vegetable sales would normally consider weather, public holidays and the availability of substitutes. Studies of brand preferences often cover other variables such as store location, the amount of service and assistance, the store's reputation and the type of store, the quality and the brand (202).

The analysis must be completed for the relevant market period. Depending on the function the grades are expected to perform, the relevant period may be an hour, a day, a week, a month, or even a season. The relevant length of time may be an hour for the wholesaler and three days for the grower. Even if the demand

relationships remain constant throughout the year one could expect different elasticities for daily, weekly, or monthly demand. One cannot assume that the demand remains the same and the prices change only because of random fluctuations in supply. Nor can it be assumed that fluctuations in supply are independent of fluctuations in demand - often less is produced because less is demanded. The alternative to Class II York cabbage may be Savoy cabbage not Class I York cabbage, while the alternative to Class I may not be cabbage at all but Brussels sprouts, so the elasticity of demand will vary with the supply of close alternatives.

There are marked regional variations in levels and elasticities of demand. Econometric analysis would provide estimates of point elasticity. What is required for a justification of the minimum standards is a calculation of the effect of removing one whole grade. This change in supply is different in quality and degree from any that has occurred in the free market. It is necessary to extrapolate beyond our experience and to use data, which, for any reason, are likely to be insufficiently varied to provide identification. This problem is insuperable, but there are others as bad, such as examining the effect of reducing the supply of 27 products by, say, 10%, not the effect of changing the supply of one product alone. No historical evidence from a free market can be used to calculate the probable price effect.

Elasticities faced by individual producers and distributors need bear no relationship to the calculated market elasticities.

Elasticities at producer, wholesaler, retail and consumer levels would have to be calculated independently. It is not possible to derive them from, say, elasticities at wholesale, plus a knowledge of market margins (203, 204). This means that data must be available on all transactions at all levels of the market.

Long run supply and demand elasticities cannot be estimated from experience of farmers' response to short run price changes. If a price rise is seen to be due to a freak of the weather, farmers will not adjust their acreage, but they will if they think the price rise will be permanent.

We can expect responses to quality to change over time. Initial reaction to an improved quality will be marked, but the improved quality will become the norm over time. The response to an improvement in a grower's quality, on the other hand may be small, but his premium will increase as his reputation for quality improves.

Econometric analysis of past supply and demand responses is only of value when one can expect that they will not change much in the future. If a grading scheme works at all it must change all supply and demand functions and so historical data will be irrelevant.

Wholesale Market Data⁴

In order to calculate the measures discussed above one should have detailed records of price, quality and quantity of each sale. However the data available on horticultural sales is notoriously bad and in a detailed study it has been shown that it is inadequate even for price control purposes (157). A few of the points made in the study are as follows: -

For econometric analysis of quality preferences the modal or median charges made each day are insufficient. It is necessary to allow for the very large differences in the price paid for even a single quality within one day and for the quantities sold at each price. Studies by Donelius (193) and Le Gallais (205) give some idea of the price variations. Donelius examines the differences between the highest and lowest price of individual lots of a single product of first class on one day. Under the Swedish auction system the differences are considerable, mostly over 20% and he concludes, "In my opinion the quality class difference or the actual acting in accordance with these rules must be insufficient. Bad quality must be punished by declassing, not by considerably lower price within first class" (193). To someone used to a commission system, it is astonishing that there was so little difference in prices. Le Gallais (205), marketing very well graded flowers in Britain, found "that in the last quarter of 1971 using 31 salesmen for carnations the average price per stem paid by the three best salesmen was 26 per cent better than the average price for the period of the three poorest salesmen", indicating high and consistent differences over a long period.

The recorded prices in a commission market may be incorrect, because of mislabelling or because of false information being given to price reporters. Records usually apply to median or modal prices of a non-random sample of wholesalers. Price reporting generally refers to the commission wholesale market and ignores the large quantity, perhaps 40% of the total, sold direct to large supermarket chains, direct to local retailers and direct to the public.

Since derogations in the grading specifications are permitted and many growers and retailers mark produce incorrectly, calculated demand functions for the grades are misleading. Further problems arise because of the decline in quality between producer and consumer.

In an auction market the quality and quantity of information available is somewhat better and Meulenberg (24) has shown the sort of analysis that is possible with the data from the Dutch auctions.

Donelius (193) reports that, on the Swedish auctions, prices are different on each day of the week because both supply and demand change through the week. This implies that a separate analysis should be done on each day.

⁴ Subsequent to the publication of this, a critique of market information systems for fruit and vegetables has been published: Peter Bowbrick, "Are price reporting systems of any use?", **British Food Journal**. 90(2) 65-69 March/April. 1988.

Production Data

It has been shown above and in (204) that one cannot get reliable estimates of the market period short -run or long-run demand functions for the different grades from wholesale market price data.

It is even more difficult to derive supply functions from horticultural cost of production data. Nor could one use this data to work out the optimum or probable response to different quality price relationships. Attempts to use production costs to determine year -to -year supply functions are also impractical. Two complementary papers (206, 207) analyse the problems in considerable detail.

Consumer Behaviour At Retail

Rhodes (218) has written a very thorough appraisal of methods of determining consumer preferences. Even in those areas where consumer preferences are examined his warnings are too often ignored, and the resulting research is meaningless.

Price recording at retail would have to be carried out by an expert staff, capable of identifying the different varieties of apples etc., grading them and noting the size. Weighing or measuring would also be needed. The difficulties are not immediately apparent to the layman, but when a horticulturist with considerable marketing experience attempted to record prices in two parts of the country for price comparison purposes, he found it very difficult to get comparable products (173). One shop would have small Irish Golden Delicious, the next would have small Laxtons, and the next would have large French Golden Delicious. With a great deal of effort, and some estimation it is possible to carry out an exercise of this sort on a one-off basis. To do a continuous study capable of getting sufficient data to draw conclusions would require an extremely large staff.

Some form of weighting is needed to allow for the turnover of different types of shop and for differences between town and country.

Even the very full and complete food surveys such as the British National Food Survey (153) do not give any information that could be of value in working out the effect of grades. One can use the income elasticity with respect to expenditure and the income elasticity with respect of quantity purchased to derive an income elasticity with respect to price paid. This could be of some value if it could be assumed that there was a consistent relationship between price paid and quality, within the period shown. Mitchell and O'Neill (23) and Cowan (148, 149) have shown that this is not always so, and several less rigorous studies give similar indications. Furthermore Thiault (27) and Meulenberg (24) quote several studies that have demonstrated that consumers of fruit and vegetables often judge quality by price, assuming that the more expensive product is better (160, 208, 209). To the extent that this happens, any analysis of purchase prices paid will give a false indication of quality preferences. It should also be noted that the elasticities are based on cross section

analysis.

The national food survey technique could provide extremely valuable information on quality requirements by various sectors of the market, but the cost of measuring quality and analysing the results would make the studies extremely expensive. Marketing experiments are likely to be more cost effective.

Almost no market research has been carried out to determine consumers' preferences. At first sight this may appear odd, but when one considers the difficulties in experimental design it is not surprising. A study could find out what attributes a consumer prefers, what combinations of attributes he prefers (e.g. a small Cox's Orange Pippin may be acceptable but not a small Granny Smith) what price he is willing to pay for each attribute, and then to find out what sections of the population have different requirements. An enormous number of replicated selling experiments would have to be carried out, even when testing only five different levels of five attributes with different price ratios, and assuming all other factors constant. In fact it is virtually impossible to determine consumers' preferences in this way with short season crops like strawberries, with crops whose prices and substitutes vary from week to week or with crops whose prices cannot be controlled by the experimenter. If the normal factors of socio-economic group, type of shop, reason for purchase etc. are included, a small country would sometimes find that it was impossible or impractical to obtain as many observations (i.e. weekly sales figures from one shop) as there were variables. For this reason market researchers working on other products frequently analyse quality differences with laboratory purchase experiments under controlled conditions, but these have their obvious limitations, chief of them being the artificial environment and the cost of replication.

There is a high variance in the data, necessitating a large number of observations. One reason for this is the existence of random disturbances.

Bass (143) points out that, since there is considerable evidence that individual consumer choice behaviour is characterized by a substantial randomness, and that there is a randomness in other factors such as out of stock situations, weather, visitors and holidays which will also affect brand choice, one cannot accurately forecast people's purchases even from an accurate knowledge of their preferences. His model of stochastic preference and brand switching is of some interest in devising an optimal grading system, though it is not directly applicable to a market with frequent random and non-random fluctuations in price and market shares of different grades and with these fluctuations being in supply rather than demand. Again, a larger number of observations is required than when people always behave consistently.

Many other practical problems exist: for example, it has been pointed out that "Consumers commonly become accustomed . . . to certain types of produce, and it is difficult, as a result, to distinguish between the part played by the real preferences of the consumer and the part played by habits that are more or less imposed by the commercial operators when the range of produce offered for sale does not provide a particularly wide choice". In one study (128) samples of produce were bought from different shops and were classified according to EEC grades. It was found that overall "Prices paid by consumers are not related to

grade nor is there evidence that buying at high prices necessarily means getting better quality or grade of produce”, though this appeared to be less true of supermarkets considered separately. This implies that, unless search cost is zero, some customers will always appear to be making an irrational choice, when, in fact, their choice was rational but was based on such factors as location of shop.

Market researchers frequently use laboratory studies, inviting students or housewives into a room and asking them to choose between certain products at different price levels. These studies are relatively cheap and the results can easily be assessed statistically, but the limitations of the studies are obvious. For instance, in such artificial situations the housewife may feel that she is being tested on her ability to determine differences in quality or on her refinement in being willing to pay for a different quality. It is unlikely that her stated opinions on fruit and vegetable quality will reflect what she actually buys when given the choice. There is no substitute for the real market.

While research at consumer level is virtually impossible it is relatively easy to determine the quality factors that lead to a high price on the wholesale market and there has been some work done abroad (118, 2, 119, 39, 38) but I know of only one study in an EEC country (24). A wholesale study of this sort measures the quality attributes the market values most. It gives producers an idea of the market demand in the short - run, enabling them to adjust their production and sorting methods and grade specifications accordingly. If market transparency is good it may even give an indication of consumer demand. I recommend that research on quality preferences be restricted to the wholesale market initially.

CONCLUSIONS

It must be concluded that the EEC grading system has no theoretical or empirical justification.

There is no economic model that would justify the imposition of a grading scheme. Still less is there a model that would be applicable to the horticultural industry. The partial models presented here show that the system is quite unsound.

Even if there had been some theoretical justification for a grading scheme, the specifications would have to be designed to fit in with market requirements. Some of the requirements of such a classification system have been discussed here and it has been shown that the EEC grading system does not meet the criteria. It has been shown that there is no empirical support for the specifications and that many are absurd.

The EEC grades do not allow for the fact that consumers inspect before they buy, that some retailers do so and that other retailers treat horticultural products as experience goods.

The aims of the EEC grading system have not been clearly spelt out, and, as a result, the system is expected to perform incompatible functions. For instance, there is a confusion between the aims of wholesale and retail grades.

Compulsory minimum standards are not in the interest of the consumer in the market period and are probably not in their interest in the short or long run. It is doubtful whether producers benefit in the short or long run.

The use of derogations from the EEC standards as a method of price or income stabilization is impracticable and has hardly ever been attempted.

Unofficial derogations are illegal, are only slightly more efficacious and are quite undesirable.

Compulsion is unnecessary if the EEC grading system has all the advantages sometimes claimed for it by the uninformed. If it is necessary to compel people to conform, there can be very few advantages, and these must be small.

How much does this scheme cost the people of the EEC? It is impossible to give a precise figure because we have inadequate data and because the enforcement is erratic and incomplete, many countries paying little attention to retail grading. If the minimum standards were fully enforced, the cost to the EEC would be between £500 million and £1, 000 million a year. I would expect that the costs of other aspects of

the system would be of the same order of magnitude.

It is recommended therefore that the present EEC system be modified, with its less desirable parts being dropped and its more useful parts being retained. The following system which is far cheaper, has fewer undesirable side effects and is more effective, is suggested

1. It should not be compulsory to label produce with the EEC grades at retail: if the retailer chooses to use the grades, he should of course be required to use them correctly.
2. There should be no compulsory minimum standards. Producers, wholesalers and retailers should be permitted to market produce that does not reach present EEC minimum standards provided it is marked Class IV.
3. Producers, wholesalers and retailers should not be compelled to use the present grading system. If they are supplying a specialized market they should be able to use their own brand or a designation such as Grade A instead. If they do use the EEC grades, the labelling should be correct and conformity to the grades should be enforced legally.
4. Market research investigations should be carried out to find out what consumers' preferences are. EEC grade specifications should be altered accordingly. As optimal specifications will vary over time and from country to country and as there are a large number of crops to be covered these experiments will be continuous. This does not imply frequent changes in specifications to conform to seasonal changes in demand. Specifications may change over a five to ten year period.
5. National governments should consult with producers and economists to identify those products, which will benefit most from quality control. They should then concentrate their efforts on these products. Enforcement and utilization of the grading system would then be far more effective because growers would be more willing to co-operate where they had asked for the grading system (as with marketing orders in the United States) and because grading inspectors would be concentrating on a few products at primary wholesale level instead of on 27 fruits and vegetables (and possibly on flowers as well) at all levels.

APPENDIX I

CONSUMER CHOICE STRATEGIES

Number of Categories

When a grading scheme is introduced the number of categories is reduced. When there is no grading at all, each item is unique or nearly so and there may be as many categories as there are items. When there are several grading systems in operation, with each major co-operative or each district having its own system, the number of categories may be as low as ten or twenty. With the EEC grading scheme there are at most five categories: Class Extra, Class I, Class II, Class III and Reject. For many crops Class Extra is virtually never seen and there is no Class II, so there are, in practice, only three categories, one of which, Reject, is never seen by the consumer. The aim of a grading system is to reduce the choice offered rather than to increase it.

The effect of this can be seen most clearly by examining the case where there is one grade for the good e.g. "Cauliflowers" and seeing what happens when the number of grades is increased. At first, then we have two commodities "Cauliflowers" and "all other goods". (It is assumed that the consumer buys on description for if he inspects each item one grade is the same as an infinite number.) (See 6).

If the seller now sorts the cauliflower into Class I and Class II according to some relevant attribute such as size or whiteness, one of these classes or possibly both will be a closer substitute for "all other goods". At worst, reject cauliflower will be a closer substitute for reject cabbage.

Both Class I and Class II will necessarily be more uniform than "Cauliflowers" and this may increase demand. The effect of uniformity on demand will be discussed below and is fully discussed in (6).

The expected level of the attribute will change, perhaps being higher in Class I and lower in Class II than in "Cauliflowers". This need not increase total demand - demand for full cream milk, for example, is higher than that for skim milk plus cream.

The demand schedule for Class I and for Class II is not directly related to that for "Cauliflowers". The sum of the two demands is not the same as that for "Cauliflowers". The elasticities could be quite different.

As the number of grades increases they will be closer substitutes. Class IX and Class X, for example, will be very close substitutes. The cross elasticity of demand increases accordingly, so if the price of Class IX doubles people will switch to Class VIII and Class X, and sales of IX might cease. This change in cross elasticities changes the optimum pricing of the seller, making discriminating monopoly more difficult.

Of course, as the number of grades increases the consumer may have more difficulty in remembering the difference. If he buys on description, and it is unlikely that he would buy fruit and vegetables on

description, he might have difficulty in coping with more than, say, ten grades, though there is no experimental evidence to show that this is so. Adequate marking and labelling, which are discussed below, would overcome this difficulty.

Consumers have shown that they can distinguish between large numbers of categories of other goods. In the tobacco industry hundreds of different categories are commercially meaningful at the first stage of marketing but, because of blending, the choice at retail is rather less, 50 to 100 brands. There is strong consumer preference for certain brands and consumers resent it bitterly if they cannot buy the brand they want. Since the tobacco industry bases its branding and advertising policy on extensive and detailed consumer research, it is likely that, for that product at least, a wide choice benefits producer, wholesaler and consumer.

The regulations forbid the sale of produce that does not meet certain standards. This means that supply is reduced and prices increase in the short run. In the longer run, better production methods will improve quality so less will be discarded, but this will increase costs. (Restriction of sale of certain goods for health reasons does not come into this discussion).

The effect on supply and demand of changing the number of categories could be complex, as shown above, but, in the absence of experiments showing the different demand functions with different numbers of grades - experiments which would be prohibitively expensive - one must conclude that the consumer benefits from an increase in the number of grades and that the EEC system which restricts consumer choice, in effect, to Class I and Class II, causes a serious reduction in consumer' surplus.

CHOICE STRATEGIES AND SORTING STRATEGIES

A consumer may use any of a number of purchasing strategies when he is deciding what item or which category to buy. To be effective a producer's sorting strategy must take this into account and the category specifications must be laid down in such a way that the consumer can use them in making his choice. In this section the relationship between purchasing strategies and sorting strategies will be discussed. The possibility of the sorting strategy being used to enable the consumer to adopt a simple purchasing strategy will also be considered.

The Purchasing Strategy

The purchasing strategy comprises a process by which alternative options are evaluated and a rule by which certain options are selected. In our context the option may be seen as a category or an item in the category. The list of purchasing strategies given here is based on the choice strategies described by Wright (130).

A rule must be used to select the item wanted. The obvious rule is to choose the best (BEST), comparing one item with another until one is clearly the best. This may involve sorting through hundreds of items repeatedly, comparing them on one attribute at a time. The effort involved may not be justified if the best 20% are all much the same. To avoid this the consumer may take all the items with levels above a certain cut-off point (ALL), or all the items with levels above this cut-off point until his requirements are satisfied (FIRST).

These three selection rules can only be used after the data on each item have been brought together and evaluated in some way. A compensatory method may be used, where low values of one attribute compensate for high values of another, e.g. where tasteless beef is acceptable provided that it is tender. Various forms of averaging may be used but we may distinguish between those where the weighting for each attribute is the same (AVGe) and that where more weight is given to some attributes than to another (AVGd). Any of the rules BEST, FIRST, ALL, may be applied to these systems.

With the other, non-compensatory, data combination process, the low level of one attribute does not compensate for a higher level of another and the product is evaluated on one attribute at a time.

With the lexicographic (LEX) model the consumer places the attributes in order of importance, taking first freshness, then appearance, than flavour for instance. He evaluates the items on their most important attributes, freshness in this case, using the BEST rule. If he can get no clear-cut answer using this rule he then switches to the next attribute and evaluates on this, again using the BEST rule.

The MINIMAX strategy compares the alternatives on their worst attributes, rejecting those with the lowest levels of an attribute or those with the most attributes with low levels. The consumer does not mind if his purchase is not the best available provided he minimizes the possibility of an absolute disaster. MINIMAX strategies make use of the BEST rule.

The MAXIMAX strategy also makes use of the best rule, with the purchaser selecting items on their best attributes, choosing the ones with the highest levels of their best attributes. Unlike the MINIMAX it accepts that an item may be bad in some respects - an apple with good appearance, flavour and colour is chosen even though it has a worm inside.

The other strategies do not use the BEST rule. With the conjunctive strategy (CONJ) for instance, cut-off levels are set for some attributes and the item is rejected if it is below the limit for any attribute. The disjunctive (DISJ) category also uses cut-off points but there an item is accepted if it is above the level for any attribute. A geologist, for example, might use DISJ, accepting any sample that had a certain level of diamonds, gold or chrome, regardless of the level of the other attributes. The BEST rule cannot be used with either the CONJ or the DISJ data combination process.

A sequential-elimination procedure (SEQ-ELIM) uses cut-off points in the same way as CONJ or DISJ. These are applied first to the most important attribute, then to the next most important and so on, until the required number are left (FIRST), or all attributes have been tested (ALL).

All these strategies can be used sequentially and sequentially in combination with each other. One might use a CONJ procedure to remove the rubbish, than an AVG procedure to evaluate what is left.

It must be remembered that, as far as most purchasers are concerned, the product -choice strategy is not scientifically designed to get them the optimum mix for a manufacturing process, but a compromise between the desire to make a sound choice and the desire to make a choice quickly and with the minimum of effort. Several of these strategies are similar and are interchangeable for some goods and for some processes - MINIMAX and CONJ are similar, LEX and SEQ-ELIM are similar, AVGe, AVGd and MAXIMAX are similar. If the consumer's preferred strategy is MINIMAX and the product is sorted to CONJ, he might be quite willing to accept CONJ, and just evaluate with respect to price.

The relationship between the evaluation processes of the buyer when purchasing, and the evaluation processes of the consumer when consuming, of the distributor when buying and selling and of the producer when sorting or labelling is discussed in 6. It is concluded that inappropriate grade specifications can seriously reduce sales when a product is sold on description and that the specifications will necessarily be inappropriate to many buyers. The distortion is less when a product is labelled with several of its attributes than when the only description is the grade name. (Ladd and Martin (215) agree on the desirability of labelling with several attributes).

This analysis shows that there are substantial gains from buying on inspection when most of the product is sold on description, using inappropriate grades. Akerlof (220) has shown that under these circumstances sale on description will become difficult or impossible.

It can be shown (e.g. Lancaster (1), Freebairn (138), Zusman (211)) that welfare is maximized when the number of grades is at least one for each different consumer's demand function (though the assumptions of the analysis are restrictive: search cost is ignored for instance). As the number of grades falls, there is more incentive to inspect rather than buy on description.

SORTING STRATEGIES AND FRUIT AND VEGETABLES

How does this apply to fruit and vegetables? Generally the product is sorted using several strategies. The CONJ strategy is used for many attributes: lower limits of the attributes are set for each category and any items that exceed the level are accepted; minimum sizes are an example. For other attributes uniformity is required: this may be seen as a CONJ strategy based on dispersion. Where overall uniformity of several attributes is required it may be seen as an AVG strategy. Tolerances also imply a cut-off procedure. Uniformity, however, raises several complex issues so it is discussed in more detail below.

Number of Strategies

It has been shown above that CONJ sorting of this sort is probably as useful as any. Nevertheless it can be meaningless if it does not approximate to the purchasing strategies of the consumers. If the category specifications lay down limits on attributes that do not concern the consumer, then produce that is perfectly acceptable is downgraded. If the limits are at the wrong level, the product may be downgraded or upgraded. If an important attribute is not considered, then unacceptable produce may pass the inspection.

When there is a large number of categories the effect of placing the limits at a level that does not reflect consumer preferences is not too important, as the consumer can take a category near to what he wants and sort that. When there are only two or three categories and there is a large number of attributes, a wrong level on any one of the attributes can make the rest of the sorting meaningless. For instance the EEC grades for strawberries specify that for Class I or Class Extra all strawberries must have the calyx attached and for Class III either all strawberries should have the calyx attached or no strawberries should have the calyx attached. The consumer who wants Class I strawberries without calyx, for jam making perhaps, finds that the product is not available, and the consumer who does not mind whether or not the calyx is attached finds that the total supply is reduced considerably by this regulation. (We are not concerned here with the effect of the regulation on wholesalers and retailers).

The more attributes that are considered in the specifications and the fewer grades that exist, the less likely it is that the grades will be relevant to a consumer in making his choice. Since there are only two or three effective EEC grades for produce and a large number of attributes are covered in the product specification it is probable that the EEC grades will not be relevant to consumers.

The EEC quality standards for apples for example specify the categories according to the following attributes:

1. Wholeness
2. Soundness
3. Cleanliness
4. Moistness
5. Smell
6. Taste
7. Shape
8. Size
9. Development
10. Variety

11. Skin Blemishes
12. General appearance of the apple
13. General appearance of the package
14. Ripeness
15. Colour
16. Reddening (not the same as colour)
17. Absence of stalk
18. Elongated blemishes (length of)
19. Speckled blemishes (area of)
20. Other blemishes
21. Skin damage
22. Keeping qualities
23. Variation of size within a package
24. Minimum sizes of different varieties
25. Uniformity of origin in package
26. Uniformity of variety in package
27. Uniformity of quality in package
28. Uniformity in degree of ripeness in package
29. Uniformity of colouring within a package
30. Correspondence between the visible part of the display and the average composition.
31. Protective qualities of packing
32. Newness of packing materials
33. Cleanliness of packing materials
34. Appropriateness of packing materials
35. Toxicity of glue and ink
36. Presence of foreign bodies in goods
37. Fruit packed in layers

38. "Quality"

To complicate matters tolerances vary from class to class, when "special circumstances" (not defined in the regulations) exist, and by variety. Different tolerances are applied for attributes such as disease, damage, lack of stalk and size. Many of the tolerances apply to the combined effect of several attributes.

To further complicate matters, definitions are very loose for most attributes and the final classification must be subjective.

Each case must be marked with name and address of packer, the word "Apples" the variety, the country of origin, the class and the size or the count, and to this extent multiple attribute marking is achieved.

It is possible that in one EEC country all these attributes are important and that the limits laid down reflect the requirements of most of the population. It is most unlikely, though, that they reflect the requirements of all the population of each country in the EEC. If there were more grades or if the grade specification defined fewer attributes the system would be relevant to more sections of the market.

EFFECT OF CHANGING CATEGORY SPECIFICATIONS

The effect of changing category specifications can be shown by taking the simplest possible situation, where a product is sorted into two categories according to a single attribute. If the borderline between the classes is shifted so that more items will fall in Class II and less in Class I then:

- (i) There is more Class II available so its price will tend to fall.
- (ii) The average quality of Class II will rise so price will tend to rise.
- (iii) The people who would have been satisfied with the lower portion of Class I may switch to Class II so the demand for Class II will rise.
- (iv) The amount of Class I available will fall so the price will tend to rise.
- (v) The average quality of Class I will rise so price will tend to rise.
- (vi) Some people who previously bought Class I will now buy Class II so demand for Class I will fall.
- (vii) Class I and Class II will become closer or less close substitutes so the cross elasticity between the classes will change.
- (viii) The ratio of the prices of the two classes will change and this too will change the cross elasticity between the classes.

- (ix) Class I and Class II will become closer or less close substitutes for other products so the cross elasticity between these and alternative products will change.
- (x) The ratio between the prices of Class I and alternative products will change, thus changing the cross elasticity between the product and competing products.
- (xi) People will substitute alternative products for Class I and Class II or will substitute Class I and Class II for alternative products.
- (xii) The changed quality of Class I and Class II may make the product suitable for some new use or, equally, may make it unsuitable for some existing use.

The overall effect may be to increase or decrease the price paid or the total revenue. If the product is sorted according to two attributes, the effect of changing the specifications of both products will be more complex still, as a change in the critical level of attribute A will produce the twelve effects listed, and the change in the critical level of attribute B will produce twelve effects, which may work in the same or the opposite direction.

The two attributes may not be independent in effect: a change in the blemishes permitted on the skin of a Class I apple for instance, is likely to affect the consumers' perceptions of other attributes such as amount of bruising or skin damage. If the amount of bruising permitted and the amount of skin damage permitted were both increased at the same time, the combined effect would be greater than the sum of the effects of changing each separately. Unless the product is sold in different markets, each of which requires different attributes, any relevant attributes are likely to be interdependent to some extent. When one is dealing with as many as ten attributes it is impossible to forecast the effect of changing all attributes at the same time.

Normally one is dealing with at least three categories: Rejects, which may not be sold at retail, Class I and Class II, so the problem of fixing limits for grades is infinitely more complicated.

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