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Management of regulation in the food chain - balancing costs, benefits and effects

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1 Making and enforcing food chain regulations - the factors that determine when, by whom, and how

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INTRODUCTION

Those of us who grew up in families are familiar with the cry 'Daddy, tell him to give me a turn!' When other people's behaviour conflicts with our own interests or preferences we may resort to 'higher authority' to attain our goals. This is rational. It is likely to be both more effective and less costly than seeking to impose our will by sheer force. To an important degree, life in communities depends upon mutual acceptance and the perceived effectiveness of 'higher authorities'. Where their views are expressed not just on an *ad hoc* basis but as judgements which are generally applicable, we have 'regulations'.

This conference takes as its starting point the report of the Food, Drink and Agriculture Task Force (1993) and the more recent report of the Deregulation Task Force (1995). Both saw overregulation as an issue for the food industry. Both recognised that to serve society satisfactorily the industries which comprise the human food chain need regulation as well as freedom to respond to market forces. The papers that follow will explore concerns about both the legitimacy and the effectiveness of our present system of regulation and the case for changes in its organisational structure. This paper seeks to identify areas in which we feel there is a need for regulation. It also draws attention to some of the limitations of a regulatory approach.

WHY REGULATE?

Market failures

Markets alone do not take account of the full economic impact of the activities of industries, including those in the food chain, on the use of resources. In terms of economic jargon, they neglect 'public goods', such as the impact on the environment, and 'externalities', the benefits or costs which the activities of one business impose on individuals or other businesses.

The out-of-town hypermarket provides a good example. It provides a huge range of alternative products under one roof saving both time and discomfort for the shopper. It can also provide a focal point for charity collectors, whose activities do not figure in the accounts of the shop but who clearly provide a service which some people value. It can ease congestion in city streets by providing adequate parking facilities, but it adds to traffic problems in suburban areas. It may generate new business for those who supply transport or service motor cars but it is likely to reduce the business of other food retailers in the vicinity. If the possibility of regulatory intervention did not exist, none of these economic benefits and costs need figure in the business appraisal of those who invest in the hypermarket.

Food safety

Markets will certainly punish food businesses which are seen to have supplied unsafe food. However, if failures in safety are not detected or attributed to the right source, markets will not penalise the defaulter. Given the plurality of possible causes of stomach upsets, the source of relatively minor failures of food hygiene may not be identified. As a result, bad practice can continue unchecked. Where a serious failure is recognised, the response of markets may be disproportionate and misdirected. For example, as producers of yoghurt will remember, where an unsafe product sold by a single manufacturer can result in a collapse in the market for all businesses who produce similar goods.

Regulations, which are seen to be effective in ensuring safety and detecting any lapses in standards, safeguard the industry as well as the consumer. Confidence in regulatory systems is essential but is difficult to achieve and is easily undermined. Changing systems of food production and distribution and changing methods of domestic food storage and use mean that approaches which traditionally have been adequate fail to meet current needs. New scientific discoveries and the ever increasing ability of instruments to detect small quantities of undesirable materials mean that any existing set of rules is likely to become outdated. Where a particular problem or perception of a need for updating is said to demonstrate the failure of the system as a whole, confidence may be destroyed in quite unrelated areas. Casual attacks on the probity of the system help neither the industry nor the consumer.

Reliable information

To make informed decisions consumers need accurate information, in terms they can understand, about the quality and many other characteristics of products offered for sale as well as their price. The range of relevant information is substantial. It involves not only the chemical composition of the food product but also its nutritional characteristics. Increasingly, there have been demands for information about how food is produced: is it 'organic'?; is it welfare friendly?; does it damage the environment? Consumers who have specific ethical or religious priorities may need to know how animals were slaughtered or whether the products contain material from particular species. Vegetarians need to know that the 'vegetarian meals' on offer contain no animal ingredients.

It is impracticable, if not impossible, for individual consumers to check all such claims. The increasing number of highly processed manufactured food products make traditional checks for freshness and wholesomeness inapplicable. Some of the language used in selling food is imprecise - for example some products are described as 'natural' - but is there really a market for 'unnatural' or 'supernatural' products? There is a serious possibility that the information provided will be inaccurate or misleading.

Regulations designed to ensure that information is understandable and accurate have a long history in food legislation. Rules relating to weights and measures and adulteration help to prevent consumers from being cheated by unscrupulous traders. However, claims relating to the complex products are not so simply checked. Rules about temperatures and hygiene in food preparation establishments can prevent some problems. Minimum labelling requirements may provide consumers with much of the information they need. To be effective, however, the rules have to be enforced and the information provided relevant and understood.

Minority concerns

One mark of a civilised society is how it looks after its weakest members. In the food industry this has to include provision for those who have special food needs or allergic reactions to products which cause no problem to the generality of humanity. It also encompasses problems of access to shopping facilities and the provision of appropriate trolleys, toilets, etc. Such provision, and the identification of products which may have an allergic effect, involves cost and is unlikely to attract a substantial volume of business. From a profit-maximising viewpoint it is unattractive. Most major food companies recognise that they have a responsibility to meet such needs and do so willingly. However, for issues such as access and the adequacy of labelling of some ingredients which may threaten the health of some

vulnerable individuals, regulations are used to safeguard those at risk. Understandably, minority groups seek to extend such regulations to offset more and more of the disadvantages they suffer.

AT WHAT POINT DO WE REGULATE?

Regulations occur whenever people join together to attain a common purpose - from the rules which govern a football match to the requirements of the treaties which establish the World Trade Organisation (WTO). Since smaller communities form part of larger national or international organisations there has to be a choice about the level at which we regulate.

In principle, it might be argued that regulation should occur at the lowest level at which it is likely to be effective. Such an approach allows for the diversity of circumstance and values which is characteristic of the many communities to which we belong. Regulations are more likely to command consent and to be observed without considerable expenditure on enforcement. In practice, people, capital and goods move between communities, so that differences in regulatory regimes may have important implications for the ability of any one group to compete. In such a situation we look to larger groupings in search of what is often described as a 'level playing field'.

The globalisation of the world economy has clear implications for regulation relating to the food industries. If there is to be a level playing field, then the regulatory regime has to cover the whole of the market and to be enforced to uniform standards. Difficulties occur where either of these criteria are breached. The successful conclusion of the Uruguay Round of negotiations in GATT (General Agreement on Tariffs and Trade) represented a modest but significant step forward towards a more open international market in agriculture and foodstuffs. However, as recent disputes between the United States and the European Union (EU) relating to the use of hormones in beef production and the current debate about the acceptability of genetically-modified soya demonstrate, differences in approach to regulation may effectively close markets and negate the expected effects of past agreements. In this situation much will depend upon the acceptance by all parties of the outcome of the WTO disputes settlement procedure.

This demonstrates a second principle influencing the appropriate level at which to regulate. It must correspond to political boundaries within which laws can be enforced. Experience within the EU illustrates both the potential and the difficulties. In the United Kingdom (UK) there is a strong lobby opposed to the transport of live animals for slaughter abroad. This is based partly on the belief that suffering is caused during transport, and partly because the conditions under which

animals are maintained and slaughtered in some foreign countries fall far short of those which are acceptable in the UK. A ban on exports would conflict with undertakings relating to trade. The only legitimate way to meet the concerns of the welfare lobbyists would be to apply satisfactory standards of husbandry and transport throughout the EU. A successful move in this direction would clearly constitute a much larger benefit in terms of the welfare of animals than simple bans on the export of live animals for slaughter from one country.

One difficulty is that not all member countries have the same perception of the need to improve matters. Tighter regulations are likely to involve higher costs. Farmers may well argue that they should be compensated, a move likely to be resisted by ministers of finance. The familiar outcome is protracted debate and long time lags in introducing those improvements which are agreed. Whilst it might quite legitimately be argued that the task of British welfare lobbyists should be to change opinion in other countries rather than to demand that the UK government bans trade, action at the domestic level seems more likely to be effective in the short run.

A second difficulty relates to enforcement. Within the EU substantial progress has been made towards harmonising rules relating to welfare but critics remain dissatisfied. As reported in Spedding (1996):

'Increasingly, Governments' actions are harmonised throughout the EU member countries but there are concerns about the extent to which agreements, directives and regulations are implemented, monitored and enforced in different countries. A powerful European Inspectorate must be the ultimate answer to this kind of problem but, whilst discrepancies occur, there is resistance to controls being applied in one country, putting its livestock producers at a competitive disadvantage with those of countries not following the rules. In fact this concern, that advances in animal welfare may impose costs not borne by competitors - whether within the EU or from outside it - is one of the major constraints on progress in this area.'

Whilst the case for international regulation is clear, in practice most regulation which affects the food industries in Europe will continue to be made and enforced by the EU and the nation state. This points out the existence of regulatory frontiers which affect not only the flow of trade but the location of research and investment. In a globalised market, such possibilities represent a real constraint on the ability of national governments or even the EU to regulate.

THE MECHANISMS OF REGULATION - WHO REGULATES WHOM AND HOW?

Politics, policies and information

Regulations are a political activity. As such they have to be implemented *via* the political and legal institutions of each country. Most of these have been shaped by past history. They form part of that network of communication and influence which we call 'the establishment'. It is understandable that those outside this framework should be critical of its operation and demand changes. However, given the changing challenges of regulating a modern food industry, it is always necessary to review the adequacy of existing institutional structures. Within the UK this debate has been given a sharp edge by suggestions that responsibility for food safety should be taken away from the Ministry of Agriculture, Fisheries and Food (MAFF). The proposed appointment of an independent food safety adviser and a committee of advisers to support him, indicates that the government recognises, at least in part, the force of this case.¹

This Conference provides the key sectors of the industry with opportunities to ventilate their problems and describe their experience. Rightly, if somewhat unconventionally, we have put the consumers at the head of the agenda. We do so because whatever regulatory mechanisms are devised and however they are administered, the ultimate test has to be that they merit and receive the confidence of the consumer. If that is absent, everyone else in the industry will suffer.

A first step in making a regulation has to be to define its target. New targets and priorities emerge *via* the political process. This includes debates within parties, campaigns by pressure groups or the media and complaints about the working of present arrangements from those most immediately affected within industry. Many claim to speak for 'consumers'. The National Consumer Council (NCC) is specifically funded by the Department of Trade and Industry to represent the interests of consumers. It has taken a continuing interest in food policy (see, for example, NCC, 1988). Those who make regulations have to judge the claims made by such organisations and balance them with other competing interests.

Successful regulation demands much more than a generally good intention. There is a need for information, for an understanding of how the industry operates and how it might respond to various types of regulatory device. There must also be an analysis of what costs and benefits might be involved and upon whom they would fall. Existing information cannot be assumed to provide an adequate picture of the industry for regulations which involve new areas. Those who seek new regulations or want to change existing systems usually present their own data. However, this may be partial, inaccurate or irrelevant. This has to be sifted and tested. In the process governments need to consult

with those who have special knowledge of the issues involved. This must include the food industry itself, but it will also involve pressure groups and private individuals who have researched the area concerned. In the food industry the need for consultation is so frequent that government has established committees, such as the Food Advisory Committee, for the purpose. It needs to be an open and public process so that there is a genuine opportunity for non-establishment voices to be heard. Where there are important gaps in information there may need to be specific enquiries. This can be a long drawn out process but if it is unduly hurried the result is likely to be bad regulation.

Policy makers' links with industry and others

Effective regulation within the food industry requires an understanding of the way in which it operates. Without this, regulations which may appear commonsense to the outsider may be ineffective or destructive. Governments, even though they may seek to operate at arm's length and apply the general principles of a 'free market' need much detailed understanding of the functioning of an industry which is to be regulated. Specialist ministries, such as MAFF, are in constant communication with their sector and may be expected to have a good appreciation of how it might respond. This implies a sustained dialogue with the industry, its representatives and sometimes individual businesses. Where existing links with the industry are weak, then a substantial effort will be needed to ensure that a balanced picture of how it operates is obtained.

A particular problem arises in the food industry, where the same regulation may apply to firms of very different size. For a major multinational equipped with specialist legal and accountancy staff it may cause few difficulties. For the small family firm where the proprietor has very largely to be his own accountant, technologist and legal advisor it may require hiring costly external expertise and/or diverting management effort from productive activity. To apply less stringent rules to small companies may lead to distortion and run the risk that unsafe product reaches a market. It will also create threshold problems which discourage the growth of successful small enterprises.

In the course of their dialogue with government, industries will naturally present their information and analysis in ways which seem likely to make any new regulation as advantageous as possible. This raises anxieties that the Ministry concerned may be captured by its industry. To put this input into perspective it is thus necessary for the regulator to consult a wider range of opinion. One obvious source of input are the pressure groups which have campaigned for a regulation. Whilst the direction of their advice will be clear and its quality may vary, many established groups have genuine expertise which may

include matters beyond the horizon of the industry itself. Voluntary groups often claim the right to be heard because they represent sections of the community which might otherwise be neglected. Pressure groups themselves gain legitimacy from being seen to be consulted. Even if their views are not accepted, their involvement reassures their supporters of their influence and effectiveness. Public disagreement may even enhance their image by making it clear that they have not been captured by the establishment.

Whilst input from pressure groups and overt consultations must be a fully public activity, some of the material which government needs in order to devise regulations is likely to be commercially sensitive. Companies who provide it need to know it will not be passed on to competitors. In the absence of such information regulations may be designed for yesterday's industry rather than that in which they are to apply. This results in inevitable tensions between the need to protect commercial confidence, the wish to pursue processes of open government and the importance of being seen to act without undue influence from the industry.

Governments and commentators tend to unite around the notion that regulations must be based on 'sound science' (see Fisk, 1996) and consultation with research workers who have explored relevant areas can be of great value in shaping regulations. However, the issues are far from simple. At least two sorts of problem arise. Science at any one point of time is always provisional. It offers no certainties, only the most complete account of the chain of cause and effect as it is currently understood. The function of research is to replace this account by another. Inevitably there is a politically uncomfortable moment at which the advice provided by 'sound scientists' changes. A second problem is that scientists seldom speak with unanimity. Any government has to choose which version at any one time it is to regard as 'sound'. Processes of peer review, repetition of experiments etc provide an establishment view but they still cannot escape the discomfort which arises when the heretic proves to be right. The range of views amongst which governments have to decide is substantial. They include differing views about what consumers want (see, for example, *Food irradiation - the consumers' view* (1990) by the Consumer Association) and varying evaluations of the scientific evidence, (for example, Snell (1986)).

Implementation

The regulators, having clarified what the intended target is, have to consider how best it might be implemented. The cost to both industry and the administration has to be assessed and related to the effectiveness of the regime instituted. Where regulations have to apply across several countries and through varying political and bureaucratic

mechanisms, there is a need to consider not just what is 'sound science' but the ways in which regulations based on it will be applied and interpreted in all the countries concerned. Where, as with EU Directives, the application is left to an important degree to national governments, then the regulators concerned will be under pressure to ensure that the way in which the rules operate does not unduly penalise their own citizens.

The UK approach to both politics and law tends to be confrontational rather than consensual. At the regulatory level this translates into prescriptive rather than indicative rules for industry. Such arrangements make it possible to identify defaulters and to prosecute successfully those who have failed, but there is a danger of introducing undue rigidity. Detailed specification enables prosecutions to be undertaken on the basis that the regulation has been broken even if the purpose which it is intended to serve has been achieved. To shield both the civil servant and the minister from the risk that a loophole may be revealed which defeats the purpose of the regulation, there is a natural tendency to attempt to cover all possible circumstances. The result may be lengthy, complex sets of rules which require specialist expertise to interpret and apply.

For many food regulations the goals of the policy are shared by all parties - eg to ensure that food is safe. However, if this becomes translated into over-precise rules, it may result in costs without any substantial increase in effectiveness. By making regulations that operate in a more indicative manner, setting targets but leaving the businesses concerned more scope to determine the means by which they are attained can be both more effective and less costly. However, such an approach is not without its problems. Government has to strike an acceptable balance between allowing enforcement agencies and businesses sensible discretion in the application of regulations, and the risk of corruption. Those countries which get this right are likely to enjoy both more effective regulation and a competitive advantage.

Regulation and responsibility

Whatever the mechanism used to formulate and enforce regulations, the ultimate responsibility has to be that of the Government as a whole. It is dangerous and probably untrue to say that MAFF operates on behalf of the agricultural and food industries, if by that it is implied it does not operate in the national interest. Quite rightly it has to present clearly the impact of regulations on the industries with which it is concerned, but decisions about how to respond must be for the government as a whole.

To be successful, regulatory mechanisms have to command the confidence of those to whom they are applied and on whose behalf

they were written. The merits of the case for establishing some food agency separate from MAFF may owe more to perception than to solving the really difficult problems governments face in regulating the food industry. However, from the perspective of the industry, if such an agency does reassure the public it may well be worthwhile. However, food scares will still arise, governments will still have to take the ultimate decisions based on evidence which is always incomplete, and lobbyists will make it their mission to inform and influence a new agency just as they do the MAFF.

THE REALITY OF RISK

It may please lawyers seeking damages and comfort those who believe life should be free from stress to assume that governments should know everything and legislate to avoid all unpleasant outcomes. However, such an approach bears no relationship to the practical limitations of what may be achieved by regulation. Not only does 'sound science' fail to provide certainty, regulators have to operate in an area of economic, political and natural risks. Even where the balance of scientific evidence points to one approach, other considerations and risks may suggest a quite different course of action.

The California law commonly referred to as 'Proposition 65' illustrates the sort of difficult political balancing act which may be involved. This requires warning labels to be placed on all products which contain chemicals which can cause cancer or birth defects. Amongst these is vitamin A which, according to the State of California, may cause birth defects. However, simultaneously the federal government is pushing vitamin A as a key ingredient in its push for improved nutrition (McKinney, 1994). Regulators have to choose whether the dangers are likely to exceed the benefits and to frame regulations which convey the information in forms which enable consumers to make informed choices. The assumption that governments should or even can provide precise guidance to consumers about such issues is unrealistic.

Even where a risk is identified and its likely incidence can be quantified, there has to be a careful examination of whether regulations are the most cost-effective way of dealing with it. In some cases, better public information may be both cheaper and more effective. In others, for example, where there is a statistical risk of 1:1 000 000 that a pesticide residue will cause cancer, governments have to take account of the costs of banning the substance in relation to the benefits it brings. In such situations it may be politically difficult to admit, but the national interest may best be served by doing nothing about the pesticide and investing in improved methods for the early detection and effective treatment of cancer.

WHEN, HOW AND WHY DO WE DEREGULATE?

One of the paradoxes of much current debate is that, at a time when there are claims for more and more effective regulations relating to food, there exists a widespread belief that our economy suffers from too many and too detailed regulations. Thus the Government has established a 'Deregulation Task Force' with a view to lifting the burden of excessive regulation from industry. Its publication, *Good regulatory principles and practice in Europe*, includes a 'Deregulation Checklist for Ministers'. It is then worthwhile to note at this stage some of the reasons for deregulation.

Obsolescence

The balance of cost effectiveness in regulation is continually changing as market patterns shift and scientific understanding grows. Thus, an unchanging set of regulations may impose growing rigidity on the food industry and consumers without enhancing food safety or enabling consumers to make more informed judgements. Particular problems arise where the introduction of new forms of food processing can be impeded because manufacturers or retailers are constrained by regulations designed to ensure that traditionally prepared foods would be safe. Minimally, the risk of obsolescence requires continued monitoring of regulations and the way in which they are enforced. Periodically, whole areas of regulation may safely be scrapped since the practices to which they relate are no longer used.

Redundancy

Legislation dealing with differing issues may impact on the same industrial process - for example, requirements relating to working time and legal restraints on the employment of young people. Later legislation may cover much the same ground, but by slight variations in wording or method of administration, result in confusion for those who are supposed to apply it. Revising existing regulations to take account of later law may make it possible to dispose of some redundant arrangements.

A particular source of redundancy arises where European law covers much the same ground as national law. In such a situation the EU law has primacy and the existence of unchanged national regulations, which more or less duplicate its provisions, may mislead. The revision and scrapping of redundant legislation avoids costly litigation.

Complexity

Regulations may become more complex either because the external world changes in a way not foreseen by their authors or because of the incremental process of updating.² Changes in other regulations, for example those relating to equal opportunities, may require revision of

regulations designed in earlier decades. Updating, to take account of rulings by the European Court, which may be drafted in a different language and on the basis of different legal traditions, can result in complications as existing regulations are adjusted.

Complexity on this scale can lead to a situation in which the requirement of the law becomes unclear. Legal advice and guidance from civil servant administrators may vary. In such a situation the outcome of the regulation becomes arbitrary, oppressive for the industry and uncertain in its effect. Its removal or replacement becomes essential.

Enforcement failures

Enforcement may fail either in the obvious sense that the regulation is not observed or, less obviously, because its enforcement proves to have unforeseen and disproportionate burdens on those to whom it applies.

If the cost of enforcement exceeds the amount which the authorities are prepared to invest in the process, it is likely that a regulation will be at best partially effective. If an enforcement system suffers from corruption, then it may be applied in ways which line the pockets of enforcers rather than protect the public. If a regulation is designed in such a way that evidence of compliance cannot be readily and reasonably provided it is unlikely to be applied as intended.

Regulations that impose excessive burdens on industry may prevent the evil they are intended to combat by effectively extinguishing the industry itself. Firms that wish to survive simply relocate to less restrictive regulatory environments or cease to trade in the area affected. Where this means lost employment or the demise of most small businesses in the sector, the effect of the regulation may well be judged to have gone well beyond the intended target.

Failures of competition

Regulations that impose costs on businesses may also become an instrument of protection. By insisting that all operators invest in some costly piece of equipment, companies who have already equipped themselves and large organisations who can readily afford to do so, may deter newcomers and force small businesses out. Businesses may also argue that the same rules should be applied to producers in other countries or imports should be banned. It seems unfair to allow foreign enterprises to compete in domestic markets using techniques that are illegal for home producers, but such regulations can prove effective non-tariff barriers, shielding high-cost domestic suppliers from competition.

Within the international community and on an even more regular basis within the EU, a great deal of attention is focused on the ways in

which regulations impact on particular countries. Since the 'devil is generally in the detail', effective international regulation requires close understanding by civil servants of the implications of alternative wordings for the industries within their own countries. If the impact of an agreed regulation, as it is applied, is regarded as unacceptable, then countries which suffer are likely to seek its repeal or modification. Current tensions within the EU's milk regime provide a contemporary example.

THE REGULATORS AND THE PUBLIC

The substance of this paper and of others which will follow is that regulation of the food and agricultural industries is complex and the need for and effects of regulation are ever changing. One result of this is that from time to time failures occur. For some individuals those failures may be catastrophic. As a result, the dangers that lurk within the food chain must always be taken seriously. However, one response to recent food scares has been to condemn the regulator. This is itself dangerous if it leads ordinary people to turn away from the best available science and resort to the nostrums of quacks and food fanatics.

There is thus a need for considered dispassionate analysis of ways in which the institutional structure of food regulation might be improved. The fervour with which some groups seize upon every failure or rumour of failure to dangle an unwary public over the pit of food disaster owes more to the techniques of fundamentalist preachers than to the patient search for understanding upon which we all depend. Such outbursts may say more about the political ambition of their authors than about food safety.

Among the propagandist phrases that commonly flow over this debate are two which add more to confusion than to enlightenment, 'sound science' and 'independent regulators'. Sufficient has been said about the nature of science to make it clear that it cannot remove risk from decisions and that, as understanding grows, it will from time to time require changes in existing regulations. It is also clear that without adequate input from the industries they regulate, regulatory authorities can easily inflict avoidable damage on those who work in food and agriculture without any significant gain to the rest of society. If 'independence' is taken to mean that the food industry has no influence over the way it is regulated, the outcome may well represent the triumph of ignorance. The duty of regulatory authorities has to be to balance one set of claims against others. To do that they must be in a position to test claims from any source - including claims of those who assert that they 'represent the consumer'.

Quite rightly, the composition of regulatory authorities needed to achieve balance will change. It is healthy that such a debate should occur. Ultimately, however the authority is constituted, if propagandists exploit each food scare to discredit the regulator's credentials, public confidence will be lost. Perhaps we need not just a new food safety agency or a food safety supremo, but a new sense of responsibility and maturity among those who write and comment on this vital industry.

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NOTES

- 1 The appointment of an 'independent food safety adviser' and a supporting committee of advisers, was announced by the Minister of Agriculture, Fisheries and Food on 30 January 1997. The aim was to restore confidence in British products.
- 2 An example of the first process is the development of fish farming - is this to be classified as part of agriculture, in which case legislation

relating to minimum wages for that industry apply, or as part of the fishing industry which is not subject to these rules. The Agricultural Wages order attempts to help:- "AGRICULTURE" has the meaning assigned to it in section 17 of the Act [the Agricultural Wages Act 1948] (that is 'agriculture' includes dairy-farming, the production of any consumable produce which is grown for sale or for consumption or other use for the purposes of trade or business or of any other undertaking (whether carried on for profit or not), and the use of land as grazing, meadow or pasture land or orchard or osier land or woodland or for market gardens or nursery grounds).

DISCUSSION

Ms Annabel Holt (Annabel's Crusade for the Environment) referred to the issues of safety and risk, which she said are odd bed-fellows; she believed the main need is to look at how to regulate safety as, at the moment, the allowable risks are too great. She urged that everybody present should consider the matter of safety tests for humans using tissue cultures, as to use animals to test for human safety is unscientific methodology.

Professor Marsh, in reply, said that the full version of his paper to be published in the proceedings, includes paragraphs on the scientific aspects. He agreed that we do have a problem in terms of both the authorities upon which we rely, and upon the developments which take place within those authorities. Science itself is a process of scepticism, of formulating hypotheses and of dismissing them. It is a process that takes place against a background of increasing capacity in terms of technology and therefore, we do need to be looking at new, appropriate and effective means of coping with the challenges presented *via* food safety and indeed many other issues in our society.