ADVISORY COMMITTEE ON THE MICROBIOLOGICAL SAFETY OF FOOD

ENSURING THAT SALT REDUCTION DOES NOT COMPROMISE FOOD SAFETY

1. At the Committee's meeting in March 2005, members received a presentation on a scientific review being carried out by the Institute of Food Research on the microbiological risks associated with salt reduction in foods.

2. The attached paper provides background information on the Food Standards Agency's work to reduce the level of salt in food, outlines the scope of the review and reports on the conclusions.

3. Geraldine Hoad will introduce the paper and Jacqui Webster from Nutrition Division will describe the FSA's salt reduction work. Dr Sandra Stringer will then give an oral report describing the results of the review. Members are invited to comment on the findings.

Secretariat
June 2005

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INTRODUCTION

1. The Food Standards Agency and the Department of Health have been working to secure reductions in the amount of salt in foods, particularly processed foods, which account for 75% of people's salt intake. These reductions are essential to help deliver the FSA's target of reducing salt consumption in the population from the current 9.5g/day to 6g day by 2010. There are also European Commission proposals for a reduction in the authorised levels for nitrates and nitrites in meat and other food products.

2. The illustrative average values in the FSA salt model are based on salt levels that have already been achieved by the industry, without compromising food safety. However, questions have been raised about the microbiological safety implications of reductions in salt in some foods. While most foods do not rely upon salt to prevent the growth of pathogens, it is recognised that it can be an important factor in the safety of certain foods, such as cured meats. The FSA has no intention that salt reduction should compromise food safety.

3. The foods most likely to be affected are processed products that require refrigerated storage and where the salt is used as an ingredient to control the growth of microorganisms. These products may require a shorter shelf life if salt levels are reduced. However manufacturers will also be looking at reformulating their products or processing/packaging them in a different way so that a shorter shelf-life is not required.

4. The Agency has commissioned a review of the microbiological risks associated with salt and nitrite/nitrate reduction in foods such as cured meats. The purpose of this review was to examine the microbiological safety implications of reductions in salt in certain foods and to establish a firm scientific basis for advice on salt reduction for smaller companies. This will be used as a basis for developing guidance for smaller companies to help them to reduce salt levels in food without compromising microbiological safety.

BACKGROUND

Salt reduction

5. Salt reduction is expected across a wide range of foods, particularly those which have ‘high’ levels and also form a significant component of the diet. Annexes 1 and 2 provide background on the FSA’s salt reduction work.

6. The FSA maintains there is substantial scope for reducing salt in meat products without affecting microbiological safety providing that the appropriate measures are taken. One major manufacturer last year committed to reductions of between 30 and 40% across key meat product categories. In Scotland, nutrient specifications for school meals have resulted in substantial salt reductions being

made in meat products to ensure that companies retain the contracts. In addition, the range of salt levels in 'like for like' meat products in itself indicates that there is substantial scope for reduction. Salt levels in burgers considered in August 2004 ranged from 0.8g per 100g to 1.5g per 100g. Salt levels in bacon varied from 1.9 g per 100g to 5.1g per 100g and in cured meat from 2.1g per 100g to 2.8 g per 100g.

7. Meat products are one of the largest contributors to salt intakes and one of the areas where there are considerable food safety concerns. As part of their contribution to salt reduction work, the British Meat Processors Association, Meat and Livestock Commission and FDF meat group established a joint working group and in June 2004 published an action plan for sodium reduction in meat products. The action plan set targets for reducing upper sodium levels at the top range of 8 product categories over the next two years. The action plan highlighted food safety as a major issue of concern and justification for not establishing targets for bacon and other cured products.

8. Following discussions with the FSA towards the end of last year, the joint sodium working group agreed to consider targets for bacon and ham. However, it was suggested that a review of the microbiological safety implications of salt reduction should be conducted in order to inform the development of guidance for small businesses.

9. Although it is necessary to reduce the level of salt in people's diets it is also important that any reduction in salt levels in foods is based on an understanding by manufacturers of the implications for microbiological safety and product shelf-life.

Tightened controls on nitrate/nitrite

10. The use of nitrites as a curing agent provides the colour and flavour of cured meat and in combination with other factors, slows or prevents growth of bacterial pathogens. It also inhibits the outgrowth of spores of putrefactive and pathogenic bacteria such as *Clostridium botulinum*. The extent of protection is due to a combination of factors (e.g. water activity, pH) rather than any single factor and hence any reduction in salt and nitrite/nitrate levels in certain foods may have implications for food safety.

11. Following the judgement of the Court of Justice in Case C-3/00, Denmark v. Commission, the Commission consulted the European Food Safety Authority (EFSA) for advice on the current authorisation of nitrite and nitrate in meat products in Directive 95/2/EC on food additives other than colours and sweeteners. On the basis of the EFSA opinion, expressed on 26 November 2003, the Commission issued a proposal to amend Directive 95/2 in October 2004, which included a reduction in the authorised levels for nitrates and nitrites in meat and other food products. The aim of this change to the Directive is to keep levels of nitrosamines as low as possible whilst maintaining the microbiological safety of food products. In addition, in line with the EFSA panels recommendations, controls on the level of nitrites and nitrates in non-heat treated

or heat treated meat products, in cheese and in fish are based on added rather than residual levels.

12. At the request of the UK, supported by Ireland, the existing system of control based on maximum residual levels of nitrites/nitrates in the food as sold, has been maintained in the Commission's proposal for certain traditional UK meat products, such as Wiltshire cured ham, bacon and similar products. The UK meat products industry claim that it would be impossible to produce these speciality foods, which use a 'live' brine in the curing process, by controlling added amounts of nitrite/nitrate as it is impossible to specify in-going amounts. A 'live' brine consists of salts and nitrites/nitrates and relies on the action of bacteria to breakdown nitrate to nitrite.

SCIENTIFIC REVIEW

Objectives

13. The Institute of Food Research was commissioned to carry out a short review with the following objectives:

- To evaluate current scientific and other relevant literature and data to inform the FSA's position with regard to microbiological safety:
  - By assessing the implications of salt and nitrate/nitrite reduction in those foods where these preservatives contribute to microbiological safety.
  - Identify those foods and microorganisms where reductions in salt and nitrate/nitrite will present the greatest risk in terms of consumer safety.
  - Identify alternative processing/preservation approaches which would compensate for reductions in salt and/or nitrate/nitrite whilst maintaining an equivalent level of safety.
  - To evaluate the extent to which reducing shelf-life could compensate for reductions in salt and/or nitrate/nitrite in those foods considered to be at highest risk.
  - To consider possible minimum achievable salt levels in different products which would still maintain the products main physical characteristics, such as texture.
  - Highlight where there are gaps in current knowledge and where there is a need for further research.
  - To provide the findings in a paper to the Food Standards Agency and make a presentation to the Advisory Committee on the Microbiological Safety of Food.

Report

14. The report of the review is provided in ACM/740 and is accompanied by a predictive model (provided to members electronically) that determines how factors need to be changed to maintain constant bacterial growth rates in compensation for salt reduction.

15. The conclusions of the report were as follows:

- There is scope to reduce salt in foods. However, as salt influences bacterial growth, survival and recovery after adverse treatments, reducing salt in certain foods will have consequences for food safety that must be considered. It may be necessary to reformulate products or reduce shelf-life to maintain product safety in certain foods. Any change in formulation, processing or storage conditions means product safety and shelf-life must be re-evaluated and action must be taken if new hazards are identified.

- The inhibitory effect of salt varies with the microorganism of concern, the environmental conditions, the presence of other preservative factors, processing and storage conditions. It is therefore not possible to make overall recommendations on safe levels of salt. Each food must be considered separately.

- Products with reduced salt or where potassium chloride or lactate have been used as partial substitutes for salt are already commercially available.

- The inherent variability of a product should be considered when salt levels are reduced. Safety margins must take this variability into account.

- Salt is not the only source of added sodium in foods. Substitution of additives other than salt with their non-sodium equivalents would help reduce sodium levels. Such reductions would not be apparent where salt concentration is deduced from chloride analysis.

- Additional pressures to alter food formulations, such as the desires to reduce nitrites, lower fat content and reduce additives must be considered along with salt reduction as they interact to effect product safety.

- Validated predictive models are useful tools when growth is affected by multiple factors and they can greatly reduce the need for product testing. Further development would extend their usefulness.

- Improved risk models are required to quantify the risks associated with changes to products. While it is possible to predict growth of a pathogen in a specific food it is much harder to determine the often subtle impact changes will have on the risk of illness in the population.

- Product safety cannot be considered in isolation. The organoleptic and technological properties of reduced salt products must also be acceptable to consumers.

- It is essential that all producers, both large and small, understand the consequences of reducing salt on product safety. Plans for effective dissemination of information to all producers are required. This may require co-operation from ingredient manufacturers, trade organisations, regulatory bodies and research organisations.

16. The Committee is asked to consider the report's conclusions and whether they see the need for any additional work to be carried out in this area. The FSA would welcome specific comments on the following aspects:

    - The scope for reducing the level of salt in certain foods without impacting on microbiological safety,

    - The ability of industry to undertake salt reductions, particularly small manufacturers.

    - How best to address the needs of small manufacturers e.g. the development of guidance.

Microbiological Safety Division

June 2005

Annex 1

INFORMATION ON SALT REDUCTION WORK

SACN advice and targets

1. Following the publication of the Scientific Advisory Committee on Nutrition (SACN) report on Salt and Health in May 2003, the FSA set targets to reduce the salt consumption of the population from 9.5g to an average of 6g a day by 2010.

2. At the Salt Stakeholder meeting in November 2003, Melanie Johnson (then Parliamentary Secretary for Public Health) requested that organisations present write to her by February 2004 outlining what they were doing to reduce salt in food. Forty-four (44) plans were received from a mixture of manufacturers, retailers and trade associations, procurement bodies, voluntary organisations and academic institutions.

3. A key feature of the plans submitted were the industry claims to have made significant salt reductions to date. Some of these that can be verified include:
   - a 16% reduction in branded breakfast cereal products between 1998 and 2002;
   - a 25% reduction in sodium levels in potato crisps in the last 10 years (1994-2004);
   - Heinz making reductions of between 11% and 18% across its product range in 2003.

4. The plans received indicated a high awareness of salt as an issue within these groups. Reduction programmes were taking place on a broad front with action at different stages between different companies and sectors. Progress had been made in the retail sector with some manufacturers also doing well. The catering sector showed more limited activity. Public procurement bodies had stated their commitment to addressing this issue with the potential to be a big positive influence on the service catering sector (e.g. schools, hospitals etc).

5. Since that time, the Agency has undertaken a programme of follow up work with key organisations, including trade associations, retailers, caterers, manufacturers and those involved with public procurement. The aim is to establish effective one-to-one working relationships, better understand the needs of different sectors and players, consolidate initial progress, and to negotiate specific measurable

commitments to salt reductions capable of delivering the Agency's target of 6g daily intake by 2010. The industry has indicated that it welcomes this interactive approach with the Agency and is generally positive about the potential for further reductions over time.

6. As a result of this programme of work, the FSA have met or had contact with around 65 key food industry organisations across all sectors on salt reduction; and 49 commitments to salt reduction work have been received from a range of organisations across all sectors of the food industry. Details of the commitments made to the end of March 2005 can be found on the Agency website at: http://www.food.gov.uk/healthiereating/salt/saltprogressstatement/

Future work

7. The next stage of the programme of work with industry will include the following:
   - Obtaining long-term plans with specific measurable step wise commitments to salt reductions capable of delivering the Agency's target of 6g average daily intake by 2010**;** and securing clear data from all relevant organisations to ensure that salt reduction claims can be verified.
   - Focussing on securing further salt reductions in both the cereal and meat product categories (these make the biggest contributions to adult salt intakes in the UK).
   - Developing a clear programme of work, including specific guidelines for salt reduction, with the catering sector.
   - Setting targets for 10 key product categories and developing a 5-year framework for self reporting by industry organisations. The targets set will take account of the outcome of the IFR review.

Monitoring Change

8. The Agency will monitor changes in salt levels both in terms of intake and actual levels in products. The National Diet and Nutrition Survey and the Health Survey for England will be used to assess changes in intake. Work is underway to establish additional monitoring mechanisms in Scotland, Wales and Northern Ireland.

9. In order to track the progress of reformulation work, the Agency has commissioned the setting up of a databank of processed food products. The databank will consist of an extensive range of processed food products, including

branded and supermarket own-label products, listing their nutrient content. As well as salt (sodium) this will also cover fat and sugar to inform possible future work. Data will be collected from product labels or from equivalent, reliable sources. It is envisaged that data collection will be repeated annually for the next 2 years, with the first data collection now having been completed.

10. A range of 'Mini Surveys' will continue to be published over the next few years to provide data on the levels of salt (sodium) and a limited range of other nutrients in processed foods. In addition, the Agency's annual Consumer Attitudes Survey monitors the proportion of respondents who are concerned about salt and those who have taken action to change their salt intake.

11. In September 2004, the Agency launched a high profile consumer awareness campaign on salt. The Agency's tracking research is now showing a steady increase in the number of people recognising that they might have a problem with too much salt in their diet and are now trying to cut down. Between August 2004 and January 2005:
    - there has been a 32 per cent increase in people claiming to be making a special effort to cut down on salt
    - there has been a 31 per cent increase in those who look at labelling to find out salt content
    - there has been a 27 per cent increase in those who say that salt content would affect their decision to buy a product "all of the time"[(1)]

    The Agency is now planning the second phase of the campaign.

FSA Salt Model

12. The FSA Salt Model was initially publicised in October 2003. Its purpose was to inform discussions on reducing the salt content of food; and to demonstrate the types of reductions that would need to be made to ensure that the 6g population average target intake value was achieved by 2010.

13. The model uses data on average consumption of food by the adult population, derived from the National Diet and Nutrition Survey (NDNS) of adults aged 19-64 in Great Britain (fieldwork 2000-01), with the exception of packet sandwiches where data is derived from the National Food Survey 2000. In the original model**,** the food groups were largely based on those that are used in the NDNS, although

some smaller food groups were created e.g. to separate purchased “ready meals” from equivalent home prepared dishes, as far as this was possible.

14. The current average sodium value for each food group is a weighted average of the sodium content of the foods in that group, taking into account the differential consumption of foods within the group. This is based on generic product types rather than brands. For example, the breakfast cereal current average sodium value reflects the fact that cornflakes are one of the most commonly consumed breakfast cereals.

15. A series of illustrative average values for specific food categories were inserted into the model such that the average salt intake is then reduced to about 6g. Like the current average values, the illustrative values are averages across the group and not an upper limit. The illustrative values represent just one of many possible ways of working towards the 6g target, and are not a fixed proposal. In addition, these values were based on the salt levels already achieved by the industry, without compromising food safety, at the time the model was devised.

16. Comments received when the model was originally put out for consultation in October 2003 and subsequently in meetings and other communications with a range of other organisations, have led to some changes being made to the model. The main change has resulted in the separation of a number of processed and unprocessed products, including meat, potato and vegetable products. It is important to note that the target average levels have not changed, except where targets have been set for new categories.

17. Further information on the original consultation can be found at:
http://www.food.gov.uk/foodindustry/Consultations/completed_consultations/completeduk/saltmodellingconsult
Further information on the revised model can be found at:
http://www.food.gov.uk/healthiereating/salt/saltmodel
and the revised model itself can be found at:
http://www.food.gov.uk/multimedia/spreadsheets/saltmodelfeb2005.xls

Bacon and Ham

18. Data in the salt model suggest that collectively bacon and ham contribute around 8% of the salt in the diet, making this the second highest contribution to intakes (white bread is the highest at approximately 10%).

19. The joint British Meat Processors Association (BMPA), Meat and Livestock Commission (MLC) and FDF Meat Group submitted its salt reduction plans to the FSA/DH last July, following an outline in February 2004. The plans set upper maximum levels for a number of categories of meats and meat products, including burgers and grillsteaks; canned frankfurters and hotdogs; deli and pork pies and sausage rolls; cornish pasties; other meat pastry products; pizza; ready meals; coated poultry and sausages. The plans estimate that these reductions would result in a 10% reduction in salt content over two years.

20. However, the plans did not include any targets for bacon and ham, as the group believed that there were food safety concerns surrounding salt reduction in these products. These issues were discussed further at a meeting in December 2004. The FSA stated that it considered that there was scope for salt reductions in bacon and ham and that new legislation on nitrates and nitrites would not have an impact on this. The FSA agreed to commission a review of existing research into this issue and consider developing guidance to support small businesses in making salt reductions. The BMPA/MLC/FDF group agreed to provide details of relevant research to the review and to set up a group on bacon and ham early in 2005. The first meeting of the group took place in January 2005.

Nutrition Division
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