



ASSOCIATE PARLIAMENTARY FOOD & HEALTH FORUM



Organic food – is it healthier?

5-6.30pm, Tuesday 10 July

House of Commons Committee Room 6

Minutes

Introduction

Lord Rea welcomed members to the meeting and confirmed that the guest speakers were Lord Melchett, the Policy Director of the Soil Association, Mr Peter Kendall, President of the National Farmers Union, and Professor Tom Sanders, Head of the Nutritional Sciences Research Division at King's College, London.

Lord Rea reminded members that earlier in 2007 David Miliband, as Secretary of State for the Environment, Food and Rural Affairs, had reiterated the FSA view that there is no conclusive evidence that organic food is healthier than conventionally produced food.

Lord Melchett

Lord Rea introduced Lord Melchett, who in addition to being the Policy Director of the Soil Association, runs an 890-acre organic farm in Norfolk, with pigs, beef cattle, sheep and arable crops.

Lord Melchett began by suggesting that public health is concerned not only with what people eat, but the environment in which they live, as the Victorians had recognised. He said that the Soil Association (SA) and the National Farmers' Union (NFU) have shared concerns about the environment.

Land use change mainly for agriculture and other purposes has been responsible for almost 50% of historical greenhouse gas emissions. Today farming, food processing and the food distribution system is one of the major emitters of greenhouse gases, producing at least 18% of the UK's total greenhouse gas emissions. The EU has found that what we eat accounts for 31% of the global warming impact of products consumed in the EU. David Miliband, as Secretary of State for the Environment, Food and Rural Affairs, acknowledged that organic food will, in many but not all cases, produce fewer greenhouse gas emissions and less pollution of freshwater sources.

The fact that organic food enables consumers to avoid negative substances, such as antibiotics and pesticide residues in food, is more contentious. Lord Melchett argued that it takes a long time for regulators to admit that they may have been wrong. The SA would say that there is a fair degree of clear evidence of ill effects associated with pesticides, for example there is concern about the damaging effect on human health of organo-phosphates. Lord Melchett said there is more evidence, and more concern, about this in America than in Europe, including the UK (see slide 8).

Chairman: Lord Rea
Vice-Chairmen: Dr Ian Gibson MP
& Baroness Miller of Chilthorne Domer
Secretary: The Earl Baldwin of Bewdley
Treasurer: Baroness Gibson of Market Rasen

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Lord Melchett cited links between antibiotic resistance and the routine use of antibiotics in conventional food production as an example of the health benefits of organic food. He pointed out that in Holland there is now a community-acquired form of MRSA which is found routinely among pig farmers. The SA has recently produced a report about this which is available on their website. The main concern about antibiotic use in conventional farming is the extent to which it removes their effective use from human medicine.

There have been some studies which have looked at the effect of “junk food” consumption on human behaviour which have found a link between artificial additives and behavioural problems in children. Lord Melchett referred to work carried out by the School Meals Review Panel and a study by Hull University. The use of artificial additives and colourings is banned in organic food production.

The SA is running a school food programme, which encourages schools to provide a healthy, balanced diet in a positive environment, with information about food and farming. They have found that in these circumstances the children enjoy their food more. Lord Melchett believes we can change the food culture in the UK for the better. This programme has proved successful in some of the most deprived areas of London, such as at a school in Hackney where over 95% of the children are eating school meals.

The SA is carrying out similar work in NHS hospitals, for example in Cornwall. They found that good quality, local Cornish ice-cream containing fresh fruit has a higher nutritional value than the processed packets of nutrient supplements often given (at some expense) to elderly patients.

Lord Melchett accepted it is difficult to define a clear nutritional benefit of organic food to individuals. A study in Sweden looked at a number of factors in relation to allergies later in life, including whether food was organic, antibiotic use, use of the MMR vaccination and other factors, but it could not isolate the benefit attributable to organic food consumption (see slide 8).

Lord Melchett said there are some clear nutritional benefits associated with organic food. Newcastle University had undertaken a literature review (see slide 18) which showed that organic food has higher levels of a range of vitamins and minerals than conventionally produced food.

A University of California Davies study concluded that organically grown kiwis had significantly higher levels of vitamin C (14%) and polyphenols (17 %). A new Polish study found that organic apple puree contained more phenols, flavonoids and vitamin C in comparison to conventional apple preserves. A further Polish study found that organic tomatoes contained more dry matter, vitamin C, B-carotene and flavonoids, while conventional tomatoes were richer in lycopene and organic acids. Previous research has found organic tomatoes have higher levels of vitamin C, vitamin A and lycopene. In the same proceedings, a French study reported finding that organic peaches have a higher polyphenol content. A University of California Davies study found 79% – 97% higher levels of flavonoids in organic tomatoes; the researchers stated that these antioxidants have been linked to reduced rates of cardiovascular disease, some forms of cancer and dementia.

More European research is emerging and Lord Melchett expects this to continue to show that organic food contains more nutrients. The FSA has acknowledged that organic milk contains higher levels of vitamin E, beta-carotene and omega-3.

Lord Melchett suggested that we do not always make enough use of our common sense. In this respect the organic food movement has often been ahead of the scientific evidence. As a pig producer he does not find it surprising that pigs bred in reasonable space with access to healthy food produce better meat.

Lord Melchett suggested that organic farming could also protect farmers from health risks associated with the use of artificial herbicides, pesticides and fertilisers. A study has found that sperm density, and abstinence adjusted mean sperm count, is higher in members of the Danish Organic Farmers Association than workers from 3 other occupational groups (see slide 24).

Lord Melchett concluded by suggesting that we are not doing a very good job at the moment in terms of feeding the world's population by using highly intensive farming methods and highly processed food. He cited studies that show that while European yields would drop, the reduction in yields in America would be less significant if conventional food production converted to organic methods. In years of drought, organic farmers do better because moisture is better retained in organic soils. In 2006 US and Danish scientists, using the World Bank's International Food Policy Research Institute's model, concluded that "In general, organic conversion in high-input regions represents a cut in productivity while low-resource areas see improvements due to adoption". Overall world food production would increase slightly if all farming were organic.

Peter Kendall, President of the National Farmers' Union

Lord Rea introduced Mr Peter Kendall, President of the NFU. Mr Kendall was Chairman of NFU Cereals in 2003, before becoming Deputy President in 2004 and President in 2006. He sits on a variety of bodies in the UK and Europe, including the Government Rural Climate Change Forum, the Sustainable Food and Farming Leadership Group and the IGD's Policy Issues Group.

Mr Kendall farms between Cambridge and Bedford and his family live in the middle of the farm, which is a conventional arable farm, which he has sprayed for twenty years. He emphasised that the safety of his food operations – and thus his family's health – is of paramount importance to him.

Mr Kendall began by pointing out that there are large areas of agreement between the NFU and the SA and he agreed with Lord Melchett's comments about the importance of encouraging children to eat a healthy, balanced diet of fresh food and the need to improve education about food. The NFU has promoted the Leaf Farm Scheme to encourage better understanding among children about where their food comes from and how it is produced.

The NFU has many members who are organic farmers and Mr Kendall sees it as an important part of the agricultural sector in the UK. He welcomes organic farmers' ability to improve their profit margins by adding value to their food production.

Mr Kendall believes that organic farming is a sound system, although he would not agree with all Lord Melchett's comments about the impact of organic farming on climate change. He suggested that some less intensive systems have a large carbon footprint. However, the NFU and SA share the objective of promoting local markets for food. Mr Kendall is not in favour of allowing food to be imported into the UK from countries where standards may be lower and the traceability of products is not transparent.

Mr Kendall suggested that the evidence of nutritional benefit for organic food is questionable. There is currently not enough evidence to recommend organic food over conventionally produced food. The FSA has said the nutritional quality of organic food and conventional food is similar. He referred to one Californian study which found that if lower quantities of fertiliser were used in the production of tomatoes, the crop would produce more flavanoids, demonstrating that different production techniques produce different outcomes. But this trial did not demonstrate that the use of organic fertilisers is better than conventional fertilisers, simply that using less fertiliser produced a crop with more flavanoids. The FSA have said dietary flavonoids may partially explain the cardiovascular disease benefits of increased fruit and vegetable intake and they are running a three-year study to investigate this further.

Mr Kendall said that differences in the quality of food in organic/non-organic comparisons have been attributed to a range of factors, including maturity at harvest, storage, transport and soil conditions. Nutritional analysis and comparison of foods tends to give inconclusive or contradictory results.

Milk contains more omega-3 if the cows producing it are fed on grass and red clover, but many conventional farmers produce their milk in this way, so this does not indicate a benefit of organic production methods.

Mr Kendall referred to the work of Professor Anthony Trewevas, who said that there was such a variety of ways in which organic food is produced that it is unlikely to meet a common standard.

With respect to other food hazards, such as endogenous plant toxins, biological pesticides and pathogenic microorganisms, the available evidence is extremely limited preventing generalised statements. There is no conclusive proof that one form of production is better than the other in terms of the presence of mycotoxin contamination in cereal crops.

There have been recent claims that agricultural use of antibiotics has led to a new form of resistant *E. coli* associated with dangerous infections in humans. However, Defra assert that strains of *E. coli* found in humans and animals are distinct from one another and that clinical problems in humans are associated with human use of antimicrobials. This is backed up by the World Health Organisation (WHO). More recently MRSA has been found in EU meat, possibly as a result of a ban of antimicrobial growth promoters and a corresponding increase in use of therapeutic antibiotics. There is no evidence that livestock acts as a reservoir for MRSA and MRSA has not been found in UK livestock. The FSA is aware of the issue and it is maintaining a watching brief.

The NFU actively encourages and supports the responsible use of antibiotics in agriculture and is a member of The Responsible Use of Medicines in Agriculture Alliance to ensure the safe and responsible use of medicines on farms. Mr Kendall pointed out that antibiotics are used in conventional and organic production systems.

Mr Kendall referred to the amount of gas being wasted by being burnt off and the growing recognition of the need to make better use of this resource by producing fertilisers instead.

Mr Kendall accepted that there are fewer pesticide residues on organic than non-organic food, but said the UK has very stringent pesticide control mechanisms for monitoring and withdrawal. Two-thirds of food tested had no residues and the majority of the remainder had residues below the maximum recommended level (MRL). MRLs are measures of Good Agricultural Practice and are set far below safety limits. He added that there is no evidence of a "cocktail effect" associated with the use of pesticides.

Conventional farmers in the UK are trying to use pesticides as efficiently as possible, so no more is used than absolutely necessary, not least in order to reduce waste. On his own farm, Mr Kendall has a scanner on his fertiliser machine which measures how much fertiliser is necessary as it covers the crop.

In conclusion Mr Kendall pointed to evidence of improving general health, with an increase in the average height of the population and increasing life expectancy. He argued that this suggests that conventional farming methods are serving the UK well.

Dr Ian Gibson MP asked how significant production methods are in terms of food's nutritional quality, for example, even if chips are made from organic potatoes the nutritional value of the food will be poor because of the amount of saturated fat it contains. **Peter Kendall** agreed that cooking methods are crucially important. He added that fresh food is higher in nutritional value than food which has been stored, while frozen food scores well.

Ian Gibson noted that organic food – and food sold in farmers' markets – is often more expensive than supermarket food and he asked whether there was much fraud, with conventional food being passed off as organic food. **Lord Melchett** said that organic box schemes cost about the same as the equivalent non-organic vegetables from a supermarket. He does not believe there is significant fraud in terms of organic labelling, and noted that this is one area in which there is already agreement at a European level on labelling standards.

Earl Baldwin of Bewdley asked whether Mr Kendall is confident that the increasing height of the population is indicative of health, given present obesity levels in the UK. **Tom Sanders** said that height is indicative of stronger protection against certain factors such as stroke and it is associated with longevity.

Professor Tom Sanders

Lord Rea introduced Tom Sanders, who is the Professor of Nutrition and Dietetics at King's College, London and is currently Head of the Nutritional Sciences Research Division. The main focus of his current research is the influence of diet especially fat intake on lipid metabolism in relation to cardiovascular health and risk of colorectal cancer. He also has a broad interest in food safety and nutrition policy.

Professor Sanders said he would focus on the issue of the nutritional value of organic and conventional food, rather than environmental or cost issues. The popularity of organic food had shown a large increase in the late 1960's and 1970's following the publication of "Silent Spring" by Rachel Carson which documented adverse effects of organochlorine pesticides on the environment. A new type of health food shop sprang up offering a variety of organic grains, seeds and pulses without packaging and promoting macrobiotics. These shops faded as these types of foods became mainstream in the 1980s. The concern about environmental and toxic effects of pesticides resulted in tighter controls on the range of persistent pesticides permitted and the establishment of minimum residue levels (MRL). As a result, the levels of pesticides present in food are much lower and levels in blood and tissues are much lower than previously and continue to decline. Professor Sanders believes consumer concerns regarding the safety of genetically modified (GM) food had been a major driver for the increased popularity of organic food over the last decade.

Consumers in the UK remain opposed to GM food because of concerns about its safety which have been highlighted particularly by proponents of organic food such as the Soil Association. In the USA where GM food is widely used, sales of organic food have increased markedly. The largest category of organic food sold is fruit and vegetables. However, in the UK dairy foods are an important category. It is also notable that alternatives to dairy products are also a major organic food category and that a high proportion of organic fruit and vegetables are imported.

Foods contain both nutrients (protein, carbohydrates, fat, essential minerals and vitamins) and non-nutritive material. Non-nutritive components such as flavonoids can have both positive and negative health effects. For example isoflavones in soya products are regarded as having beneficial effects on menopausal symptoms but may have adverse "gender bending" effects on infants. The nutritional importance of flavonoids and isoflavones is uncertain and remains a question of weighing the balance between positive and negative aspects.

The major factors that influence the composition of food of plant origin are: soil, maturity, weather conditions, time from harvest to consumption and, most importantly, food preparation and cooking methods. Professor Sanders described how soil composition and climate affected the nutrient content of wheat. In North America wheat has more protein and selenium and is good for bread-making. In the UK wheat is lower in protein and low in selenium, better for making biscuits. However, UK wheat can be used to make bread if it is treated with a type of food additive called a flour improver such as ascorbic acid (vitamin C). The UK is no longer dependent on North American wheat for bread-making because of the use of these food additives.

How food is stored and how long it is stored also has major effect on the content of some vitamins, notably vitamin C. New potatoes have far more vitamin C than old potatoes and old potatoes that have been stored have even less vitamin C. Potatoes now reach the market much more quickly than in the past and the vitamin C content of potatoes as consumed has risen.

Professor Sanders described how peas stored in their pods for four days have much less vitamin C than freshly picked peas. Peas that had been canned and stored for six months have much less vitamin C than freshly cooked peas (see slide 10), although frozen peas have more vitamin C than “fresh” peas stored for four days in their pods and then cooked. Numerous studies had compared the nutrient composition of organically grown fruit and vegetables and, although there was a trend in some studies which suggested slightly higher levels of vitamin C in the organic crops, these findings were not consistent and may be explained by other sources of variation.

A systematic review of the literature as well as analytical surveys conducted by governmental agencies in the North America and the UK indicate that there are no clear differences in the nutrient composition of organically produced fruit and vegetables compared with those using conventional methods.¹² Professor Sanders concluded that the variations that have been reported are within the normal range of variation and that the nutritional content of organic foods was “substantially equivalent” to traditionally produced crops. It could be argued that the failure to demonstrate clear differences may be due to differing sampling and analytical methodologies. However, any minor differences that might be detected in future more tightly controlled studies were unlikely to be of any nutritional significance given the much larger effects of post-harvest losses, food processing and cooking on the nutrient content of food.

Important factors affecting the composition of food of animal origin are breed, age, season and diet. Professor Sanders stated that the published scientific literature does not show any substantial difference in nutrient content between organically produced and conventionally produced animal products – the variations which occur are well within a normal range and where difference had been reported these were more related to production systems (for example the use of grass and silage fed rather than animals stall fed on grains). Seasonal differences also have a significant influence on the nutrient content in grazing animals. For example, summer milk has a higher fat and carotene content than winter milk due to increased grass intake. Cows fed on fresh grass produce milk with relatively more linolenic acid (omega-3) and less linoleic acid (omega-6) compared with stall fed animals who produce milk containing more linoleic acid (omega-6). This is because leaves are rich in linolenic acid and grains/grass seeds are rich in linoleic acid. However, the contribution made by dairy produce to total intake of omega-3 fatty acids was small and needs to be offset by the relatively high amount of saturated fat in dairy fat. There have been assertions made in the media that farmed salmon contains lower amounts of long-chain omega-3 fatty acids than wild salmon. However, an analytical survey by the FSA found no significant difference in omega-3 content between non-organic and organic farmed salmon. The omega-3 content of wild fish is more variable according to where it has been feeding and season.

The UK diet provides a surfeit of most nutrients but a few are in short supply among some sections of the population: iron, calcium, folate and vitamins B12 and D. The published scientific evidence does not show any differences in the nutrients between organically and conventionally produced foods. Professor Sanders reported that his own published research on vegans and vegetarians indicated that they tended to select organically grown foods. However, he noted that inadequate intakes of iron, calcium (among the vegans), vitamin B12 and vitamin D were still relatively common. Reference was made to a large Dutch study of a community following macrobiotic diets.³ This study had found that nutrient deficiencies were common among the children (rickets in the children – probably a consequence of vitamin D deficiency and a high intake of brown rice which is rich in phytate) as well as long standing neurological problems associated with a B12 deficiency.⁴ He concluded that selecting organic food does not protect against nutritional deficiencies and that it is the overall balance of foods that make up a diet that matters.

¹ Williamsom C.S. Is organic food better for our health? *British Nutrition Bulletin* June 2007; 32 (2): 104-108.

² Bourn D. & Prescott J. A comparison of the nutritional value, sensory qualities, and food safety of organically and conventionally produced foods. *Critical Reviews in Food Science and Nutrition* 2002; 42: 1-34.

³ Dagnelie PC, van Staveren WA. Macrobiotic nutrition and child health: results of a population-based, mixed-longitudinal cohort study in The Netherlands. *American Journal of Clinical Nutrition* 1994; 59 (5):1187S-1196S.

⁴ van Dusseldorp M et al. Risk of persistent cobalamin deficiency in adolescents fed a macrobiotic diet in early life. *American Journal of Clinical Nutrition* 1999; 69(4): 664-71.

Professor Sanders indicated that from a public health perspective the major concerns are the rising prevalence of obesity and the role of diet in non-communicable diseases such as cardiovascular disease rather than nutritional deficiencies. The FSA traffic lights labelling of foods was launched to empower consumers to make healthier choices with respect to the levels of total fat, saturated fat, salt and sugar content in food. He concluded that there appeared to be no major difference between organically produced and conventionally produced foods with respect to fat, saturated fat, salt and sugar contents. Professor Sanders noted that like many processed foods, organic foods were high in salt and saturated fat. In some cases organic products were labelled with implied health claims in terms of on pack endorsements. The Advertising Standards Association had upheld two complaints against the SA for describing organic apples as “healthy” and “more humane”. It was noted that the EU Health Claims Regulation which came into force on 1 July 2007 will require scientific substantiation of health claims. Professor Sanders suggested that the “organic” label was in a limited number of cases being used to promote the sale of unhealthy foods – notably “organic sea salt” and “organic vodka”.

Professor Sanders concluded that there are no clear differences in nutritional value between organic and conventional produced foods and he expressed concern that the “organic” label was being used to sell unhealthy products. However, he recognised that most of the foods that carried the organic label (for example wholegrain cereals, legumes, fresh fruits and vegetables) are a desirable part of a balanced diet regardless of how they were produced.

Questions

Earl Baldwin of Bewdley said that in the late 1990s the Government had advised people to peel apples and carrots because of pesticide residues and asked if this were no longer necessary.⁵ **Professor Sanders** said that at that time high levels of organophosphates had been found at the top of carrots. Peeling removes both artificial and naturally occurring toxins, for example moulds. However, MRLs had been exceeded in only 1 in 20 samples and MRLs are set at 100x the level at which a risk could occur to human health if the food was eaten repeatedly, so there is little risk of harm from pesticide residues on food in the UK. **Peter Kendall** said that there had been a significant reduction in the use of pesticides in the last five to six years. He runs a strict assessment regime so that he only uses them when necessary. Now, for example, more herbicides are being used – by both organic and conventional potato producers – to try to limit the amount of potato blight caused by the recent wet weather. He welcomed the trial currently being undertaken by BASF to investigate effectiveness of a potato that has been genetically modified to resist potato blight. **Lord Melchett** acknowledged that the view of the majority of experts on Government bodies take the view that pesticide use in the UK is safe, but the SA’s view is that if you can do without them do not use them.

Lord Melchett responded to some of the comments made during the meeting. He said that major retailers have done more to depress organic prices than any one else. The organic farming movement in the UK pre-dated the publication of Rachel Cousins’s book by some thirty years. The higher levels of omega-3 in organic milk persist from summer through the winter months. **Professor Sanders** said that the difference in omega-3 content between organic and non-organic milk is statistically significant, but nutritionally insignificant. The FSA is producing notes to follow an interesting discussion on this issue. Production methods are important and less intensive farming systems are better than huge “factory farms”, in terms of the nutritional value of the food they produce.

Lord Melchett noted that the FSA encourage people to eat oily fish and expressed concern about the sustainability of fish stocks. He said that short-chain omega-3 essential fatty acids (EFAs)

⁵ The CPA subsequently informed the Chairman that the original recommendation related to organophosphate pesticides which were known to accumulate (particularly in carrots) just under the skin. At that time they were used as granular soil applied insecticides for the control of carrot fly. They are no longer approved for use on carrots so it is no longer necessary to peel carrots to avoid them.

found in organic milk can be converted to the long-chain EFAs found in oily fish, but acknowledged that this conversion is poor in humans, though recent evidence suggests it is better in women than in men. **Professor Sanders** pointed out that increasing consumption of milk in order to obtain omega-3 fatty acids would also increase saturated fat intake. He suggested a better way of obtaining omega-3 fatty acids would be to eat the eggs of chicken fed on grass.

Alan Long of Vega Research said that organic farming practices in the UK were based on a lot of work done on traditional mixed farms in India. He noted that organic beef herds in the UK had largely avoided BSE. The only organic herds to be affected were where cattle had been bought in. He argued that the risk of TSEs from conventionally farmed beef herds had been a far more important factor than the relatively insignificant difference between organic and conventional herds in terms of their vitamin and mineral content. Zoonotic diseases, which are associated with resistance to antibiotics, are more prevalent in dairy and veal herds where more intensive production methods are used, but organic farming is no better than conventional farming.

Conclusion

Lord Rea thanked the speakers for their presentations, noting that although the speakers were unlikely to reach full agreement however long the discussion lasted, members had very much enjoyed listening to the arguments being debated.

The next meeting of the Forum will take place after the Parliamentary Recess, on Thursday 25 October, when we will be launching the report of our inquiry into the influence of diet on behaviour. A notice with full details will be sent to members during the summer.

CLC, July 2007