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GUIDELINES FOR GROWERS TO MINIMISE THE RISKS OF MICROBIOLOGICAL CONTAMINATION OF READY TO EAT CROPS

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INTRODUCTION

Following recommendations by the Royal Commission on Environmental Pollution and a Parliamentary Select Committee Report that the spreading of untreated sewage sludge on agricultural land should be phased out in the United Kingdom, major food retailers expressed their concerns about food safety. Although no health problems resulting from sludge disposal had been reported and industry practice fully met the requirements of the EU Directive, National Regulations and Codes of Practice, pressure from the market place demanded changes. After lengthy negotiations a new "Sludge Matrix" was agreed which has seen the phasing out of the use of untreated sludge, tighter restrictions on the level of treatment, on the types of crops to which sludge is applied and on non-harvest intervals. These voluntary restrictions are being included in revisions to the Regulations.

Following such changes it was only to be expected that attention would become focussed on animal manures, especially with the increased concerns about organisms such as *E. Coli 0157, Salmonella, Listeria and Cryptosporidium*. The Ministry of Agriculture (now part of DEFRA, the Department for Environment Food and Rural Affairs) and the Food Standards Agency (FSA) commissioned research to consider various aspects of the problem. These included the occurrence of these organisms in farm manures and slurries and their persistence during and after storage, treatment and spreading. (Nicholson et al. this meeting). One outcome of this research has been the production of a draft booklet giving guidance to farmers growing "ready to eat crops". Funded by the Food Standards Agency (FSA) the project has been a joint initiative with DEFRA, the Environment Agency, food sector interests and farmers representatives including organic farmers. Advice is proposed to minimise the risk of disease transmission in relation to site selection, handling and use of fresh and treated/stored manures, field operations, harvesting and packing. The particular problems of organic or ecological agriculture have been considered in drawing up the advice. It is hoped and expected that the guidance will be adopted not only voluntarily by farmers but also by the various product assurance schemes to which they operate, including organic production standards.

The guidance has been released for public consultation. This paper summarises the draft guidance under the headings used in the document. It then discusses some of the issues raised to date in the consultation.

WHAT CROPS POSE THE GREATEST RISK?

Microbiological contamination of crops unlikely to be cooked before they are eaten poses the greatest risk to human health. Known as "ready to eat" such crops include salads, fruit and some vegetables. Crops with a short growing season such as salads and strawberries are particularly vulnerable. In the United Kingdom up to 10% of the area growing ready

to eat crops may receive farm manures in the year of planting. Additionally some crops are grown on land after animals have been grazing. The use of manures and growing after animals is thought to be more prevalent in organic agriculture. Although washing after harvest will significantly reduce the risks of contamination not all crops are routinely washed. For organic (ecological) crops and in some countries for all crops, the use of chlorine in washing water is prohibited. This reduces the effectiveness of washing.

SOURCES OF CONTAMINATION

Contamination may occur not only by applying before the crop is planted but by application to growing crops, run-off from manure stored in fields, transfer via contaminated equipment and vehicles, aerosol or windborn contamination from livestock units or spreading in nearby fields during the growing season, contamination of irrigation water and livestock having access to cropped areas.

WHAT KILLS PATHOGENIC MICROORGANISMS?

Pathogens that are found in the manure may be killed in the manure itself or after application to land. The main factors involved are heat, sunlight, pH, desiccation and time. The latter is important because pathogenic organisms cannot survive indefinitely outside the animal host. However in some conditions they can survive for several months.

MINIMISING RISKS BEFORE CROP ESTABLISHMENT

Site selection

Avoid fields that have been recently manured or have had stock in them. Wherever possible adopt a rotational policy for manure use that separates application from ready to eat crops. Avoid fields that are adjacent to livestock units. Avoid fields where there is a risk of run-off from yards, or manure storage areas.

Use of fresh manure

Leave at least a 6-month gap between the application of fresh manures and the harvest of ready to eat crops. Leave at least a 4-month gap between livestock being in the field and harvest of a ready to eat crop.

Use of stored or treated manure

Manures can be treated to reduce microbial contamination by composting, aerobic or anaerobic digestion or lime treatment. Manures subject to any of these methods of handling should not be applied within 2 months of harvesting ready to eat crops. Although pathogens can be killed by exposure to sunlight manures should be incorporated as soon as possible as this will reduce direct crop contamination and will reduce odour and ammonia emission.

MINIMISING RISKS DURING THE GROWING SEASON

Manures should not come into contact with the growing crop. Therefore do not apply manures to the crop and avoid spreading in neighbouring fields if there will be a risk of subsequent run-off or if there might be wind-born contamination. Ensure that manures do not contaminate sources of irrigation waters especially by leaching from stores. Keep livestock

MINIMISING RISKS AFTER HARVEST

In addition to good worker hygiene, packing and storage protocols ensure that all harvesting machinery and equipment is clean. Do not drive through manure en route to the field. Ensure all containers are clean and take particular care if crops are packed in the field. Use only potable water for washing crops.

GENERAL MANAGEMENT

Include manure management and use in all HACCP (Hazard and Critical Control Points) and COSHH (Control of Substances Hazardous to Health) assessments. Record all manure applications on a field by field basis. Always follow Good Agricultural Practice and guidance in relevant Codes.

SOURCES OF INFORMATION AND ADVICE

A comprehensive list of relevant information sources for further details is provided.

CURRENT SITUATION WITH BOOKLET

The draft guidance is currently subject to consultation with stakeholders. At the start of this period a workshop was held at which the evidence on which the advice is based was presented and an opportunity given to discuss the proposals.

REACTIONS TO THE PROPOSALS

To date stakeholders have agreed that such advice is timely and necessary. However they have been concerned that the advice is presented in a positive way so as to reassure both growers and consumers that UK produce is safe and of high quality and that these guidelines are designed to strengthen the current situation.

Concern has been expressed that the research may not have covered the highest risk situations and that further work may be needed before such advice is finalised. The situations envisaged are manures with particularly high pathogen loadings, winter spreading, and the possibility of Listeria die-off being compromised by internalisation in the crop. It has been note that many growers already allow at least 12 months for all manures between application and harvest of these crops.

Whilst treatment by composting, fermentation or batch storage are accepted as reducing pathogen loadings there is case for requiring assurance that it has been done effectively. This could mean farmers having to record treatment conditions e.g. temperatures attained for a certain duration during composting, to demonstrate compliance with the specified conditions. This would have considerable practical implications not only for farmers but also for somebody to check such records.

The 4-month period after grazing land with livestock causes some concern. On the one hand it is not clear why a shorter period is allowable compared to fresh manures. It has been suggested that HACCP principles should be applied for different livestock. On the other hand it is envisaged that certain small-scale organic growers with integrated systems might find the current proposal restrictive, particularly where free-range poultry are on the same holding as ready to eat crops. However it is accepted that the guidance should be the same for organic and conventional growers.

Some consultees felt that a comprehensive manure matrix covering all crops should be drawn up to mirror that for sewage sludge. The drafting group had rejected such an approach because it was felt that the time needed to obtain the necessary information would be excessive. Also that by including crops and production systems where the risk of contamination was very low would only serve to draw unwarranted attention to the use of manures.

CONCLUDING COMMENTS

Despite the input of a wide range of interests it is clear that there will need to be extensive consultation in order to obtain consensus among stakeholders on effective and practical guidance. However with the increasing interest in food safety it is unreasonable to expect that farmers will be able to continue to operate without clear advice in this area even if the current situation does not give undue cause for concern.