ADVISORY COMMITTEE ON ANIMAL FEEDINGSTUFFS

Fifth ACAF Meeting 27 June 2000 – Information Paper

RESEARCH PROJECTS RELATING TO ANTIBIOTIC RESISTANCE

Secretariat  June 2000
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Purpose

1. At its fourth meeting on 4 May, the Committee was informed that the Government was looking into alternatives to antibiotic growth promoters as part of considerable research on antimicrobial resistance. Members requested further information on this. This paper outlines the joint Veterinary Medicines Directorate (VMD)/MAFF research programme in this area.

Why is research carried out on antimicrobial resistance?

2. The main drivers behind work in this area are:

- Protection of the public from bacteria in food that express antibiotic resistance.

- The welfare and health status of domestic animals on farm.

- Protection of the environment.

What is MAFF doing to carry forward the specific recommendations on antimicrobial resistance?

3. The importance and prominence of antimicrobial resistance in human pathogens has increased as more strains of multiple resistant organisms are identified, placing greater significance on the limited number of antibiotic compounds still available for therapy. Although derivatives of some of these compounds have been used for many years in animals, there is increasing public concern over the development of antibiotic resistance in human pathogens and other bacteria from animals. These bacteria might cause disease directly or act as sources of transferable antimicrobial resistance genes for human intestinal bacteria.

4. The recent report of the House of Lords Select Committee on Science and Technology on this issue drew attention to this link between food animals and man as did the Advisory Committee on the Microbiological Safety of Food (ACMSF) in its report ‘Microbial Antibiotic Resistance in Relation to Food Safety’.

5. The research programme funded by MAFF, the VMD and the Scottish Executive Rural Affairs Department (SERAD) seeks to provide scientific
advice to the expert advisory committees and Ministers on the potential for antimicrobial resistance arising out of the use of veterinary medicines in their broadest sense. Although the Government’s response to the ACMSF report has yet to be published, the current and planned programme of research already reflects some of the concerns expressed. It is highly likely that the ACMSF recommendations will form the main framework for the future programme of research.

6. Organic farming has led to research which may be applicable as the market forces change with the increasing drive towards reducing antibiotic resistance. There is a range of husbandry related research with industry under the sustainable animal production LINK programme.

7. MAFF has supported research on vaccines but mainly targeted to foodborne or other zoonoses because vaccines for other diseases were seen as “near market” and more suitable for pharmaceutical companies or LINK. Work on infections or diseases other than zoonoses has tended to be strategic research on immune mechanisms to maintain expertise from the point of view of being able to support identification of new and emerging diseases to protect the public and improve disease surveillance and animal welfare.

8. In addition to the above, the Food Standards Agency is in the process of placing work recommended by ACMSF to provide a facility for an antibiotic resistance typing and an archiving facility.

9. Outside of the direct research on antimicrobial resistance there are two programmes which may have some impact on production or husbandry systems. These are the animal diseases and animal welfare research programmes:

Animal diseases

10. A key focus of work on animal diseases, particularly endemic diseases is an emphasis on alternatives to pharmaceutical control of disease. A major objective of this programme is to reduce the need for, or dependence on, antimicrobial substances for the control of disease and to promote alternatives. This may be achieved through, amongst others, strategic research on immune mechanisms to promote immunological control methods; the study of genetic resistance to disease; the epidemiological study of diseases in relation to housing and husbandry practices that reduce disease incidence.
Animal welfare

11. The drivers in this case are distant from antimicrobial resistance but the output from this programme influences both husbandry and production systems. Husbandry and production systems are key to the most widespread diseases that impair welfare most and treatment for these diseases is the most likely to engender antibiotic resistance organisms. The objective of animal welfare research is to provide the basis to support the MAFF policy objective stated in the departmental business plan: “to ensure that farmed animals and fish are protected by high welfare standards and do not suffer unnecessary pain or distress”. This is a wide ranging programme that includes research on on-farm welfare, welfare during transport and welfare at slaughter.

12. The work undertaken on these programmes is listed on the MAFF internet website:- http://www.maff.gov.uk/r&d. Developments may be monitored on-line at this internet site.

Has any work been carried out to compare the costs/benefits of extensive and intensive farming practices?

13. The following summarises relevant areas of research commissioned by MAFF.

Public Protection

- Development of improved finishing systems for pigs using fermented liquid feed where antimicrobial activity is generated by the lactic acid bacteria during fermentation.

- Improved livestock rationing systems and genetic improvement of feed conversion efficiency to reduce the dependence on antibiotic growth promoters.

Welfare and Health Status

- The organic livestock research programme has not addressed antibiotic resistance. However, of relevance to the question is a recent review “Animal Health and welfare in organic livestock systems: Identification of constraints and priorities” conducted for MAFF by the University of Reading, 1999.
**Extensive Farming Practices**

- MAFF has for many years supported research to develop improved varieties of grasses and legumes for UK pastures, thereby encouraging extensive ruminant systems.

- A Technical Advisory Report “Improved Uplands Pastures: The Bronydd Mawr Story” has been issued which looks at the development of management systems for upland pastures to optimise extensive grazing systems.

- An extensive review was conducted for MAFF by the Scottish Agriculture College in 1997 – “The adaptation of rare breeds of British livestock to different environments: A review.

- There is an ongoing programme of organic farming research into biodiversity and nutrient loss to the environment in extensive livestock systems.

**Future and Current Antimicrobial Resistance Research**

14. Annex 1 lists the projects that have been identified by MAFF/VMD from the proposals submitted for funding in recent years. These represent studies of relevance to VMD and/or MAFF AHVG and reflect a much wider spectrum of issues than antimicrobial treatments.

**Sea Lice Monitoring Project**

15. The total cost of the “Ecological effects of sea lice treatment agents” project is £749,149 (MAFF’s contribution is £326,099) over three years plus an “in kind” contribution of £150,000 from Scottish Quality Salmon over the same period. The study is being carried out over three sites. The project aims to look at the wider ecological consequences of the use of sea lice treatments by conducting long term, broad scale BACI (Before After Control Impact) studies at a range of low energy fish farm sites, encompassing all the currently available or presently proposed sea lice treatment chemicals.

Veterinary Medicines Directorate
June 2000