



Antibiotic resistance – problems and solutions



Sustainable Food Trust

A global voice for sustainable food

Richard Young
ORC Conference - January 2014



Is there a problem with farm antimicrobial use?

- **"If we don't take action, then we may all be back in an almost 19th Century environment where infections kill us as a result of routine operations. We won't be able to do a lot of our cancer treatments or organ transplants." Dame Sally Davies CMO"**



Is there a problem with farm antimicrobial use?

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- **"A simple cut to your finger could leave you fighting for your life. Luck will play a bigger role in your future than any doctor could." Dame Sally Davies CMO"**

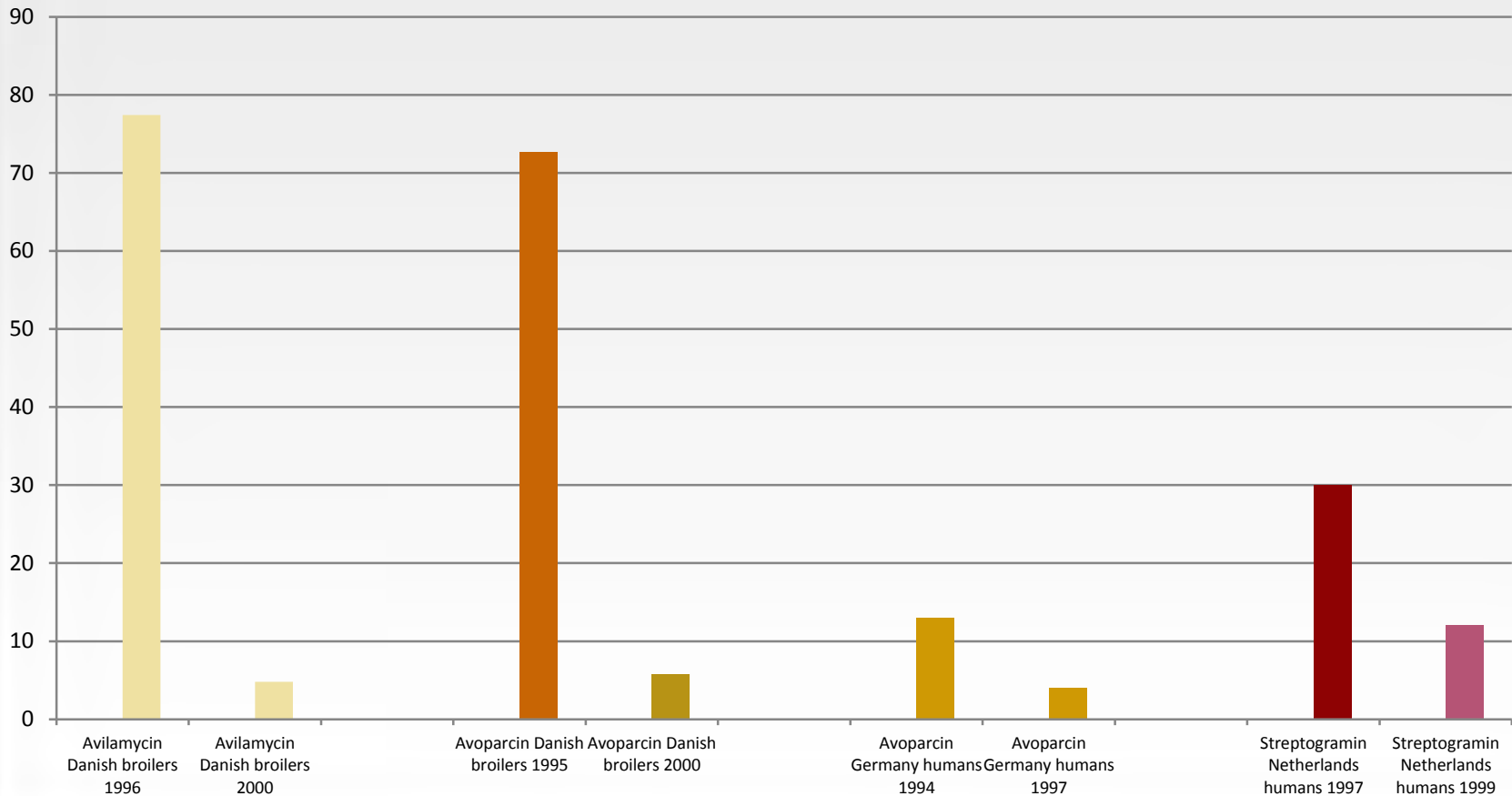


AMR – The future?

- Last new major class of antibiotic 1987
- Peak antibiotics about 1954!
- 40 new antibiotics under development, 5 in phase III trials, but only one new Gram-negative antibiotic in pipeline but only active against one infection
- Heading towards breakdown of healthcare systems as we know them : no safe joint replacements, Caesareans, cancer treatment or organ transplants



Resistance to growth promoters fell after bans





Government's view

*'There is scientific consensus that the use of antimicrobials in human medicine is the **main** driving force for antimicrobial-resistant human infections.'*

Anna Soubry MP, Parliamentary Under-Secretary for Health, Hansard 9 January 2013



AMR problems linked to farm use

- Salmonella and campylobacter
- Extra-intestinal E. coli
- MRSA
- Enterococci
- Clostridium difficile? Gonorrhoea? Klebsiella?



Waste milk: an ESBL E. coli and MRSA resistance reservoir?

- Waste milk produced during withdrawal period after antibiotic use is fed to calves on 70% of farms. Organic regulations do not permit this use of waste milk.
- Defra found cefquinome, a modern cephalosporin, in 21% of waste-milk samples. Older cephalosporins also found in smaller quantities. Cefquinome widely used for lactating-cow and dry-cow therapy.
- Defra found ESBL-producing bacteria, including E. coli, in 6% of waste-milk samples, including CTX-M14, CTX-M-15 and CTX-M-1, all common in humans.
- Defra scientists say 'feeding untreated waste milk to calves can lead to exposure to antibiotic resistant bacteria, including bacteria containing CTX-M enzymes'. Other Defra research has found much higher levels of ESBL E. coli in calves than in cows. Waste milk may also now contain MRSA.

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F.W. Davis Event Official Guide 2010 27/8/10/10/12

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 Sturminster Newton, Dorset DT9 9JG.
 1 Thomas E. Zilliox et al., Knappe TN, Proc. World Biologics Congress, 2004.
 2 Shupler et al (2005) Pharmacokinetics aspects of a new dry cow therapy, Cattle Practice, 11, 227-230.
 3 Shupler et al (2005) Efficacy, Toxicology & Kinetics of World Biologics Conference, 2004.

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WINTER 1947

The Farmer

THE JOURNAL OF ORGANIC HUSBANDRY

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Comes from the farm

UDDER TROUBLE CURED NATURALLY

By STANLEY WILLIAMS, Bryn Llys, Eprif, Cardiganshire.

THE following is a very interesting example of natural methods applied to the treatment of animal diseases. The animal in question was a young Ayrshire heifer that had calved her first last June in a perfectly normal manner and had taken her place in the milking herd. She was not an outstanding milker but had given a steady 2½ to 3 gallons per day for the first three months, and by the first week in October she was down to about 2½ a day.

On recording night (a Wednesday night), the second week of October, she only gave 2½, instead of the expected 8½, to 9½, and the cowman reported a slight hardness high up in the udder. From experience we have found that hosing with cold water is a certain cure for all temporary ills of the udder, especially torn teats, and so it was done in this instance.

The following morning the heifer gave no milk at all, the machine and hand stripping only produced about 2½. It is interesting to note that as far as appearance went what milk she did give was perfectly normal. Further the udder was now definitely tight and fairly hard. We persisted with the cold water hosing of the udder, the heifer still coming in and out with the milking herd, but the condition was gradually getting worse. By Sunday the visible symptoms were as follows: Eyes swollen and puffed, the whites being

very bloodshot; slight swellings under the chin, brisket and down the hind flanks; udder enlarged, tight and very hard. Milk veins and milk well very swollen.

Heifer Fasted.

The heifer was now isolated and tied up so that she could be starved, but within a couple of hours her condition was really alarming. The swelling of the milk veins and the milk well had extended over a wide area and the udder was completely obliterated when looking sideways at the animal. At this stage the veterinary surgeon was called in and he diagnosed dropsy. But he could not state the cause. The heart was in a very low state, but whether the cause of, or caused by, the oedema it was impossible to say.

The vet prescribed a heart stimulant and an injection to stimulate the kidneys so as to hasten the removal of fluid, but even with this treatment he did not guarantee a cure. He was aware of our attitude towards drugs and medicine and so was not offended at our objecting to this treatment and deciding to merely assist nature as far as we could.

Natural Treatment.

Realising that tying the heifer in the cowshed for a few hours had caused the condition to become more

pronounced it was obvious that exercise was essential. We therefore turned her out into the calves' paddock, and we chose this paddock for two reasons. Firstly, the animal would be under observation and would be kept undisturbed, and secondly, this paddock had had a week's rest after being grazed absolutely bare so that the grass was young and succulent. This together with twice daily stripping constituted our natural treatment. After

24 hours the swellings had definitely abated and after 48 hours had entirely disappeared, leaving only a slight tightness of the udder. After four days the milk returned, and the heifer rejoined the milking herd, but for the sake of the animal's future health she was put to suckle calves. We realise that our great mistake was in not ensuring that the heifer did not receive any concentrated food (though home-grown) immediately the so-called illness began. The dropsical condition was caused by normal feeding at a time when the animal's body was entirely concerned with clearing up a toxic condition, the root cause of which was immaterial, and even normal feeding at such a time was over-feeding and placed too great a strain on the constitution.

Consult a Vet.

An important point which comes to light from this experience is that we who believe in natural methods are apt to overlook the importance of consulting a trained veterinary surgeon, though he may be strictly orthodox. The trained man can point for us a clinical picture of the animal at the time. Disease or illness is the outward visible sign that Nature, the Universal Healer, is correcting a wrong, and it is necessary for man to assist in the process and to do this it is essential to have a true clinical picture. There is a great need for co-operation between the unorthodox and the orthodox. The general tendency is for one to try and score off the other, and such bickering is liable to sidetrack the main issues. Nature Healing is positive, a maintenance of health and not the overcoming of disease.

STERILITY IN CATTLE—continued from previous page

throughout the winter and if adequate shelter can be available, night too, for is not the moon often connected with love and romance? Who knows what might pass through an old cow's head as she lies placidly chewing her cud on a fine moonlight night.

Demanding Too Much.

To return from what some might call the highly imaginative to sound facts. I would like to say there is a great deal we do not know about sterility. We are, I feel sure, demanding too much from our cows in these days of intensive commercialisation of animal life.

Our aim should be an average lactation of about 1,000 gallons per

annum for a mature cow. A good cow will give this easily, but if forced to yield much more in particular lactations her health and breeding abilities will suffer.

Farmers seem to be quite prepared to drag all the milk they can from their cows as quickly as possible and with a shake of the head, they say, "A good 'un but she was out too soon," not for one moment blaming themselves for her early end, due to their management.

The Editor has for some time past been advertising for cows suffering from sterility, perhaps some day he will tell us his plans or his results, either, I am sure, will be most interesting.



True cost of antibiotic resistance

- Current cost to UK estimated £10-11 billion (£5 bn NHS, £5 bn societal costs)
- Farm use contributes to AMR E. coli (c. 50%?), ESBL E. coli (c. 20%?) (MDR salmonella and campylobacter (more than 50%), MRSA (1-4% but increasing), VRE and others (unknown). Possible spread of ESBL resistance in UTIs (from gut bacteria) to gonorrhoea would create global health crisis
- Overall maybe 10% of AMR costs i.e. £1 billion pa

The economic burden of antimicrobial resistance: Why it is more serious than current studies suggest. Report for the NHS, Smith R and Coast J 2013



Joint Committee on the use of Antibiotics in Animal Husbandry and Veterinary Medicine

REPORT

Presented to Parliament by the Secretary of State for Social Services, the
Secretary of State for Scotland, the Minister of Agriculture, Fisheries and
Food and the Secretary of State for Wales
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SWANN

Threat of 3d on bacon

THE Government's proposed ban on antibiotics in livestock rations will put up the cost of food, Mr Bill Weekes, agricultural marketing lecturer at Newcastle University warned yesterday.

It would mean an extra 3d. a lb. on bacon with eggs and



poultry also costing more. The extra cost to farmers of doing without the drugs that speed growth and prevent illness would be nearly £31 million a year.

Another £30 million would be

needed to finance new buildings and equipment as the present rate of turnover would drop and new livestock management methods would have to be adopted.

Worst hit would be the small farmer, writes the veterinary advice and feed-mixing equipment that the large, integrated producer would have on hand.

"DAILY MAIL" - 6/1/70

"DAILY TELEGRAPH" - 6/1/70

DRUGS PLAN MAY RAISE FOOD COSTS

By Our Agricultural
Correspondent

BRITISH farmers will be faced with increased costs of between £31 million and £37 million a year if the proposals to restrict antibiotic feed supplements to prescription only are put into effect, an economist said in London yesterday.

Mr Bill Weekes, an agricultural economist at Newcastle University, also said food prices would rise if the proposals were adopted.

The Swann Committee recommended in November that the use of gentamicin and the tetracyclines in feedingstuffs should be prohibited and that certain other drugs should be available only on prescription. The Government accepted all these recommendations.

Attitude varies

But yesterday Mr Graham Cherry, of the Graham Chevy Organisation, which was commissioned by pharmaceutical firms to carry out a survey of pig and poultry farmers, National Farmers' Union secretaries, and veterinary surgeons, said the attitude of farmers varied from condemnation to acceptance.

They estimated that the cost to livestock farming would be about £25 million for pigs and £12 million for poultry, excluding egg production.

N.F.U. representatives said the whole cost should come out of the new farm price review. Seventy-five per cent of veterinary surgeons said the proposals should be implemented immediately without further research.

Mr Weekes, who conducted a study for a group of pharmaceutical concerns, estimated that the price of bacon to the housewife could rise by 3d a pound through the implementation of the proposals.

"DAILY EXPRESS" - 6/1/70

Price warning

The Government was warned yesterday that the cost of food production will rise by about £36 million through restrictions imposed on the use of antibiotics. Bacon could cost 3d. a lb. more.

Some suggest the use of drugs like penicillin in feeding stuffs.

"GUARDIAN" - 6/1/70

Cost of no farm drugs

BY OUR AGRICULTURAL CORRESPONDENT

Those of the biggest pharmaceutical firms supplying the farming industry said yesterday that if the recommendations of the Swann Committee to restrict the use of antibiotics are implemented, farmers' costs will rise by at least £30.9 millions a year.

The firms claim that the cost of pig and poultry products will rise threepence a pound on the retail price of bacon, for example. And they say that small and medium farmers would be at a disadvantage.

They add that since the level of disease in animals would almost certainly rise, the total volume of antibiotics used could increase rather than fall.

Mr W. G. R. Weekes, a lecturer in agricultural marketing at Newcastle upon Tyne, who produced the figures, admitted that there was a lack of information. He had had to rely on

experience rather than objective statistics, he said.

His figure of £30.9 millions extra cost comprised £10.5 millions for medicated foods available only on prescription; £10.5 millions for additional food if antibiotics could not be used to promote growth; and £9.9 millions to cover the additional mortality among poultry and pigs if antibiotics were restricted.

Mr Keith Grainger, for the three firms—Cyanamid, Pfizer, and Eli Lilly—said they wanted antibiotics and other medicinal aids to be administered under proper control. But they suggested a system of licensing—supplying only feed compounds which employed scientific and technical staff.

The Minister of Agriculture has accepted the Swann recommendations and is expected to table regulations in about eight weeks.



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