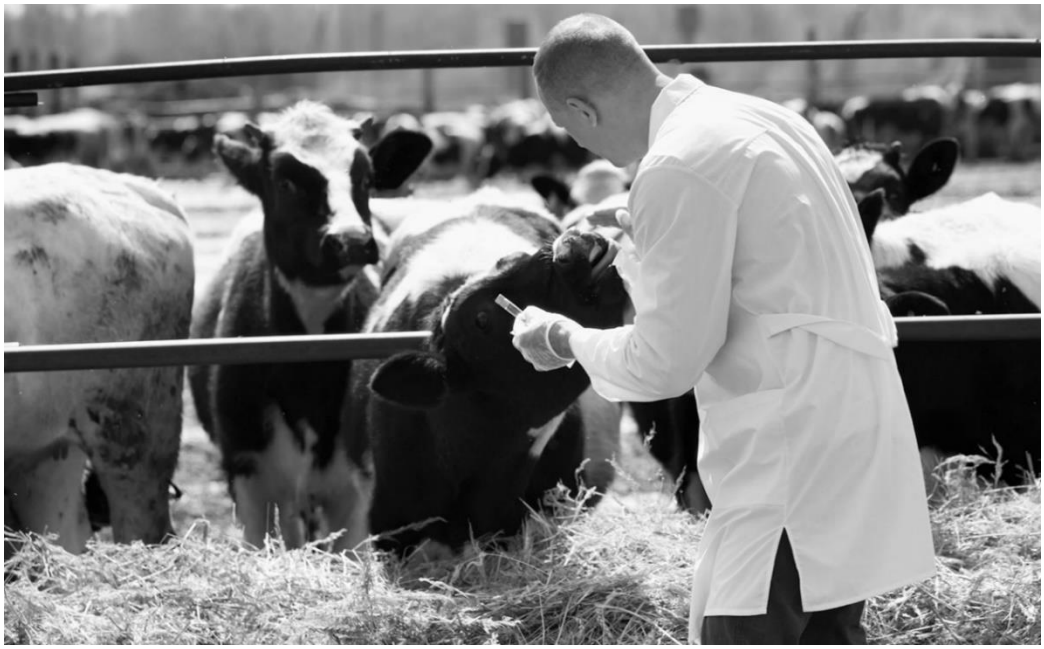
ALLIANCE TO SAVE OUR ANTIBIOTICS

Antibiotic use in the UK dairy sector



It is currently legal within the EU for dairy farmers to use antibiotics routinely for purely preventative purposes. The most common reason for antibiotic use in dairy farming is to control mastitis (inflammation of the mammary gland and udder tissue, usually due to bacterial infection). This often involves "blanket" use of antibiotics across all cows to prevent the occurrence of mastitis during the 'dry' period; when dairy cows are rested between the end of one lactation and the start of the next (typically around 60 days).

A 2010/11 Defra survey found that 85% of non-organic farms used routine, non-selective dry-cow (non-lactating) therapy.[i] Dairy cows receive on average two antibiotic treatments annually, one to prevent and one to treat mastitis. There are a range of antibiotics available for such use, including cefquinome - a third generation cephalosporin. This class of antibiotics has been classified as 'critically important' for humans by the World Health Organisation. The most commonly used antibiotics for dry-cow therapy are older cephalosporins, with modern cephalosporins being used by about 16% of farmers.

Antibiotics are also frequently used to treat mastitis in lactating cows. Such targeted use of antibiotics in the udder has historically been considered to pose a low risk for the development of resistant bacteria. However, the Defra survey showed that more than 90% of dairy farms feed waste milk to calves, and further Defra research showed that 21% of waste milk samples contained cefquinome[ii] and 6% contained bacteria resistant to modern cephalosporins (ESBL bacteria).

Furthermore, US research has linked the routine prophylactic use of antibiotics in dry-cow therapy to increased resistance in the faecal bacteria of cows.[iii]

In 2015, UK dairy sector sales of active ingredient of antibiotic intramammary products were recorded at 3,107kg (1.64g per dairy cow), with sales of dry-cow therapy products accounting for 1,898kg. Overall sales of intramammaries have remained broadly stable for the last five years, although use per cow has fallen by about 10%. There has, however, been no reduction in the use of dry-cow therapy per animal. In 2014, 8.9% of intramammary products sold contained modern cephalosporins (compared to 8.3% in 2013).[iv]

Progress in this sector

Dairy farmers are now being encouraged to reduce antibiotic use. From 1 October 2015, Arla Foods has required all its producers to take steps towards adopting selective dry-cow therapy in their herds.

There are now a number of initiatives aimed at providing dairy farmers with the means to identify the bacterial strain on the farm and deliver selective treatment based on the results. A recent survey carried out by Farmer's Weekly found that many respondents claim to be testing for mastitis-causing bacteria on farm, and that 78% are using internal teat sealants[v] which have proved effective for mastitis prevention, although it remains common for farmers to use internal teat sealants in combination with antibiotic dry-cow therapy.

The increasing scrutiny being applied to antibiotic use in the UK dairy sector is welcome, as is the drive by many in the industry to equip farmers with appropriate tools to mitigate for the financial and welfare challenges that may arise from shifting away from routine antibiotic use.

Does this go far enough?

Due to difficulties in identifying the bacteria which cause mastitis infections, most dairy farmers treat every case of mastitis, despite evidence that not all cases benefit from antibiotics. Gram positive bacteria like staphylococci and streptococci usually require intervention with antibiotics, whereas research indicates that Gram-negative bacteria such as E. coli can have a self-cure rate of up to 90%.[vi] It has been estimated that antibiotics labelled for intramammary use would not be justified for 50 to 80% of clinical mastitis cases.[vii]

While total antibiotic use in dairy farming is much lower than in pig or poultry farming, some of the antibiotics used are particularly important to treating human infections, such as the modern cephalosporins.

The continued use of these antibiotics in the UK dairy sector has dangerous implications for both human and animal health. The European Medicines Agency has said that 'the concentrations [of Ceftiofur in the intestines of treated animals] are high enough to select for resistance'.[viii] In 2010 the Veterinary Laboratories Agency reported that dairy farms which used modern cephalosporins in the previous year were four times more likely to have animals carrying extended-spectrum beta-lactamase (ESBL) producing E. coli.[ix]

What more must be done?

The UK dairy sector must cease using modern cephalosporins for dry-cow therapy or for any preventative purposes. Modern cephalosporins should only be used for the treatment of individual sick animals where sensitivity testing has shown that no other antibiotic is likely to work.

Dutch dairy farmers have already introduced a voluntary ban on the use of modern cephalosporins for dry-cow therapy. This move resulted in just one kg of these antibiotics being used in cattle in 2015.[x] According to the Dutch Chief Veterinary Officer, this voluntary ban have contributed to a 92% reduction in the Dutch farm use of these antibiotics between 2009 and 2012.[xi] [xii]

Routine use of antibiotics in this sector must end. Routine preventative antibiotic use in farm animals has already been banned in a number of European countries, including Sweden, the Netherlands and Denmark. The Alliance to Save our Antibiotics is calling for:

- **A ban on routine/blanket use of antibiotics for dry-cow therapy**
- **A ban on the preventative use of modern cephalosporin antibiotics for dry-cow therapy. These antibiotics should only be permitted for treatment of individual sick animals where sensitivity testing has shown no other antibiotics are likely to work**
- **Ambitious targets should be set for reducing the overall levels of antibiotic use in dairy cows. At present there little data on use levels, so data collection must be improved before targets can be set.**

Recommendations for action

In consultation with representatives from the dairy industry, the Alliance to Save our Antibiotics has identified three potential measures to optimise animal welfare and immunity, mitigate the risk of zoonotic diseases and - ultimately - reduce the need for antibiotics in this sector:

1) Animals should be kept on pasture

Intensive production, where animals are typically kept in overcrowded conditions and are bred for maximum production, can compromise animals' immune responses, and facilitate disease to develop and spread.[xiii] *Studies show that factors relating to the intensification of the dairy industry are associated with high on-farm mortality rates,*[xiv] *whereas smaller farms, and those that provide access to pasture, have lower mortality.*[xv] *Larger herd sizes have also been linked to high somatic cell counts.*[xvi]

The European Food Safety Agency has stated; "If dairy cows are kept permanently on a zero-grazing system, there is an increased risk of lameness, hoof problems, teat tramp, mastitis…and some bacterial infections." [xvii]

Switching to higher welfare systems, with pasture access, can help to optimise animal health and reduce the need for antibiotic use. Scientific research indicates that zero grazing has a detrimental impact on the health and welfare of dairy cows. Studies in the UK, Norway and Sweden have found that organic dairy farms achieve the same level of mastitis control as conventional farms that often use antibiotics routinely. [xviii] [xix] [xx] [xxi]

2) Move to selective dry-cow therapy

There is an increasing industry shift towards selective dry-cow therapy, where every cow gets a teat seal at drying off and only animals known to have problems with infection receive antibiotics. Using internal teat seals can help to reduce clinical mastitis levels - meaning less treatments for clinical cases.

Collection of individual cell count data is required in order to assess the status of each cow and the risk from selective cow therapy. A high herd cell count (ie 250,000-300,000 or more) indicates a problem with sub-clinical mastitis. Farmers who are not milk recording may need to collect individual samples for cows and have them tested before the drying off period.

Trials are currently taking place in the UK which are examining the efficacy of test kits which allow farmers to culture mastitis-causing bacteria on the farm. These kits aim to identify the pathogens in 24 hours, permitting farmers to make an informed decision on whether or not to intervene with antibiotics. Studies have shown that on-farm culture systems can reduce antibiotic use by 50% with "no changes in the risk of disease recurrence, bacteriological cure, somatic cell count, milk production, and survival throughout lactation". [xxii] [xxiii]

3) Maximise herd health, welfare and hygiene

Efforts to maximise herd health and welfare, rather than focus solely on milk yield per cow, have the potential to greatly reduce the need for antibiotics, and also to boost the length of a cow's productive life.[xxiv] *Cows should be bred for robustness and good health, rather than for high levels of production. Dairy cattle breeds selected primarily for high milk production are more likely to experience metabolic and physiological stress - which can impair immune function.* [xxv] [xxvi]

Grazing should be managed to reduce the risk of disease transmission. Pasture should be well-drained with good cow tracks, and cows should be kept at low stocking densities and rotated to new paddocks frequently.

Hard flooring, inadequate bedding and crowded conditions can increase the likelihood of cows developing mastitis or lameness. [xxvii] [xxviii] *Housing should therefore be designed around cow comfort, with good ventilation, suitable humidity, high quality bedding and good hygiene practices.*

"The prevalence of resistance in the agricultural sector is generally higher in animal species reared under intensive production systems."
Food and Agriculture Organisation of the United Nations

"In production systems with high density of animals or poor biosecurity, development and spread of infectious diseases is favoured, which leads more frequently to antimicrobial treatment and prevention of those diseases. This provides favourable conditions for selection, spread and persistence of antimicrobial-resistant bacteria."
European Medicines Agency

Proving it's possible

Farmer Field School approach reduces antibiotic usage by 50% in Danish dairy cattle

A group-based learning process - the Farmer Field School - has helped to halve antibiotic use in Danish dairy cattle.

The Farmer Field School approach has been used globally to drive improvements in agriculture. It aims to facilitate common learning based the exchange of knowledge and experiences, by convening farmers regularly to discuss technical problems and to share experiences.

Dr Mette Vaarst, an organic farming specialist from Denmark's University of Aarhus, has been using the approach with organic Danish dairy farmers to help reduce dependency on antibiotics. Over a period of one year, farmer groups met monthly on a different farm to discuss one success-story and two problem areas as perceived by the host farmer. Over the project period, participants committed to improvements on their own farms, such as improved herd management, health promotion and disease preventing measures. The groups were successful in reducing antibiotic usage by approximately 50% over this period, with no discernible negative impact on health & welfare and a tangible improvement in the farm environment.

This approach may be replicated in the UK and other European settings as part of a collaborative EU research project to support both organic and non-organic farmers to reduce dependence on veterinary medicines while maintaining high welfare standards.

Read more: http://orgprints.org/13731/1/13731.pdf

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The Alliance to Save Our Antibiotics is an alliance of health, medical, environmental and animal welfare groups working to stop the over-use of antibiotics in farming. It was founded by Compassion in World Farming, the Soil Association, and Sustain in 2009, and is supported by the Jeremy Coller Foundation

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