

# A survey of current farming practices in England and Wales relating to the use of antimicrobials in dairy cattle and feeding of waste milk



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## Introduction

In recent years bacteria, particularly *E. coli*, have emerged with resistance to 3<sup>rd</sup> and 4<sup>th</sup> generation cephalosporin antibiotics. These antibiotics are widely used as front line treatments in human medicine and the development and dissemination of bacteria resistant to these medicines is a serious medical problem. This resistance is mainly conferred by the production of enzymes such as Extended Spectrum Beta Lactamases (ESBLs). Ongoing surveillance studies at the Veterinary Laboratories Agency have observed farms where ESBL *E. coli* are present and detected more frequently in young calves than older cattle. Calves are sometimes fed waste milk, which is milk that cannot be sold for human consumption. Waste milk might include colostrum, mastitic milk and milk from cows treated with antibiotic or non-antibiotic medicines that may lead to a residue in the milk. The purpose of this survey was to assess current practices for the antibiotic treatment of dairy cows and feeding of waste milk to dairy-bred calves on dairy farms in England and Wales.

## Methods & Response Rate

A sampling frame of dairy farms in England and Wales stratified by herd size was constructed from the Cattle Tracing System database and 4000 farms randomly selected from this. Each farm was sent a postal questionnaire and covering letter explaining the purpose and background to the study. A sample size calculation showed us that at least 385 responses were required to allow us to estimate with 95% confidence what proportion of farms were carrying out these practices.

In total 569 farms responded to the survey, of which 527 (93%) kept dairy cows and reared calves to weaning and so could complete the questionnaire in full (Fig. 1). A summary of the key findings from the survey are presented below.

## General Farm Characteristics

Of the 527 farms that completed the questionnaire, 81% did feed waste milk to calves. We had responses from 48 different counties across England and Wales with the highest proportion of results from Devon (11%) and Cumbria (8%) - counties known to have some of the highest cattle populations in Great Britain. The herd size of respondents (adult milking cows) ranged from 1 to 1000 with a mean herd size of 154 (Fig. 2).

The majority of respondents (74%) calved all year round. Of those that calved seasonally, autumn was the most common season for calving (13%) followed by spring (8%).

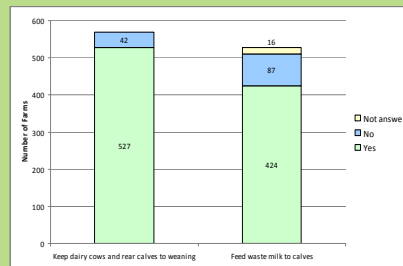


Figure 1 A summary of responses to the survey

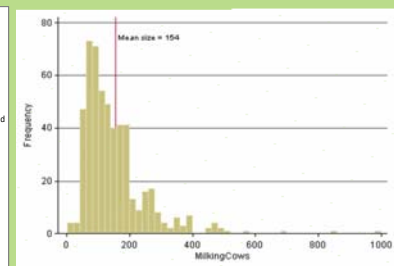


Figure 2 Distribution of the sizes of milking cow herds on farms which took part in the survey

## Antibiotic Treatments

The number of cases of mastitis treated during lactation in the last year ranged from 0 to 500 with a mean of 47 (Fig. 3). Around 90% of respondents used antibiotic tubes to treat mastitis. Cefquinome, a 4<sup>th</sup> generation cephalosporin, was the second most frequently used (Fig. 4). 96% of respondents used dry cow antibiotic tubes at drying off. Cefalonium, a 1<sup>st</sup> generation cephalosporin, was most frequently used by 43% of farms (Fig. 5).

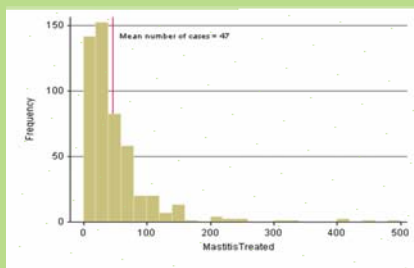


Figure 3 Distribution of the number of mastitis cases in dairy herds

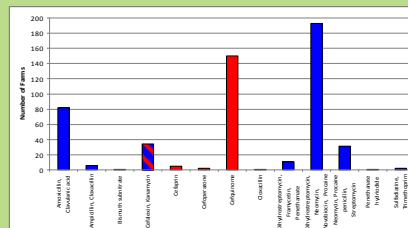


Figure 4 Frequency of milking cow tubes used to treat mastitis in lactating cows, grouped by active ingredients. Red bars indicate cephalosporins (patterned bar = cephalosporin in combination with other antibiotics)

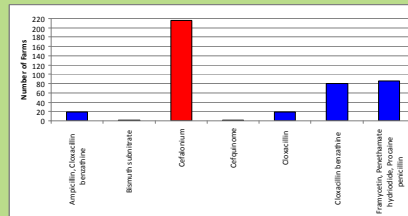


Figure 5 Frequency of dry cow tubes used at drying off, grouped by active ingredients. Red bars indicate cephalosporins.

The most commonly used injectable antibiotics were Tylosin (27% of farms) Dihydrostreptomycin & Procaine penicillin (20% of farms) and Ceftiofur, a 3<sup>rd</sup> generation cephalosporin (13% of farms) (Fig. 6). On average, respondents used their most commonly used injectable antibiotic in 18% of their herd.

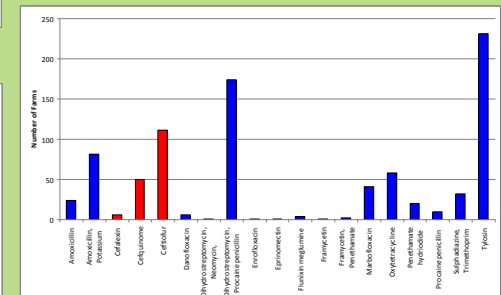


Figure 6 Frequency of injectable antibiotics used in dairy cows. Red bars indicate cephalosporins.

## Waste Milk

This survey revealed that the majority of farms leave calves to suckle for up to 24 hours after birth. The least common practice was to remove calves straight away although this did occur on around 15% of farms.

As shown in Fig. 1, 81% of respondents did feed waste milk to calves. The survey also revealed that 356/410 respondents fed milk to calves from cows with mastitis (87%). Fig. 7 illustrates that the majority of waste milk contained milk or colostrum from cows in receipt of antibiotics.

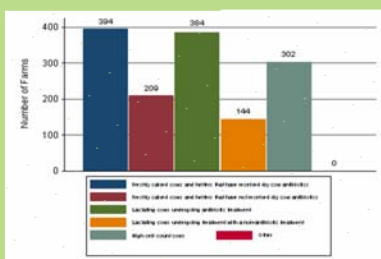


Figure 7 Description of the contents of waste milk on farms which took part in the survey. Multiple answers could be given so individual farms may be represented more than once.

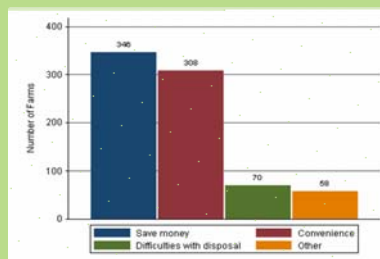


Figure 8 Reasons given by farms for feeding waste milk. Multiple answers could be given so individual farms may be represented more than once.

The most common factor affecting respondent's decision to feed waste milk to calves was to save money, closely followed by convenience (Fig. 8). Other factors that were specified generally consisted of improvements in calf growth and immunity.

## Further Work

This survey has provided a great deal of data on current farm practices in England and Wales which has not been available before. The key data obtained has been presented here and shows that the feeding of waste milk from cows in receipt of antibiotics is common in England and Wales. Further work is underway to assess the levels of antibiotic residues in waste milk, and to determine whether these can select for ESBL *E. coli*. That information, in combination with the data obtained by this survey will be used to develop a risk model to assess the risk of the acquisition or selection of ESBL *E. coli* from feeding calves waste milk and to recommend practical control measures.