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Antibiotics and Sterilisers

IN THE DAIRY INDUSTRY

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As a consequence of the rapid advances made in all aspects of technology there are an ever increasing number of preparations becoming available to the dairy farmer, to assist both in the control of disease in his crops, pastures and animals and to maintain and enhance the quality of his dairy products. These are—antibiotics, sterilisers, detergents, various weedicides and pesticides.

An examination of the antibiotics position suggests that it is following the same pattern in relation to animal health as has been the case in human administration of these drugs.

It has been known to microbiologists for a long time that bacteria have the ability to develop a resistance to a specific drug over a period of time and that, eventually, its usefulness may become limited, or restricted. As a consequence it becomes necessary for the technologists to either develop an entirely different practice or produce a new drug in order to control the ravages of the particular disease.

It may seem at first glance that the whole principle of the control of disease by means of the administration of antibiotics may ultimately become useless, and would thus develop into a race between bacteria and man in competition to produce resistant strain and new drugs. Fortunately the picture is not so gloomy.

The important factor is slowing up this race and maintaining the handicap in favour of man consists in the wise and discreet use of treatments. It would be quite possible because of geographical limitations and restrictions in the number of professional staff to confine the issue of antibiotics to a veterinary prescription. Hence they are more readily available in many cases than is desirable. If we consider, mastitis as a particular case, two situations appear to have arisen which are gaining momentum contemporaneously.

Because of the increasing resistance of the mastitis organisms to antibiotics, some dairy farmers are increasing the dosage. Because of the availability, they are tending to use them more frequently than may be necessary, in anticipation of trouble, rather than first having resort to preventive methods of cattle husbandry. Such standard procedures as the use of the strip cup, care and attention to detail of the mechanical efficiency of the milking machine, the practice of milking infected cows last should always be uppermost in the minds of the dairy farmers, and recourse should be made to treatment by therapeutic means only when these other methods have failed.

What then is the result of this mis-use of antibiotics? It has many repercussions. For the purpose of this article—we will look only at the effect on the cow and the quality of the resultant product.

From what has already been said there need be little elaboration of the ultimate effect upon a cow. The situation could quickly be reached where the casual organisms of mastitis had become so resistant to known antibiotics that their administration is likely to be almost useless. This position has not yet developed entirely, but there are signs of it being present amongst a proportion of the dairy...
cattle population. Dairy farmers can stand to lose economically on two counts—the cost of unnecessarily high dosages of antibiotic and loss of production.

Speaking specifically of penicillin, it is well known that this is secreted and remains as a residue in milk or cream supplied to the dairy produce factory. It is not destroyed by heat or any of the manufacturing processes and remains active in the milk for periods of at least 72 hours after administration.

It has been ascertained quite conclusively that relatively small amounts of penicillin remaining in milk used for cheese manufacture can cause failure or serious reduction in the activity of the cheese starter.

Without being concerned about the various technicalities involved, the final result as far as the Dairy Industry is concerned is a reduction in quality. Any practice which reduces the quality of the final product will ultimately be reflected in the financial return to the individuals comprising the industry as a whole. Hence the recommendation which has always been made, that milk from cows treated with antibiotics should be withheld from sale for at least 72 hours after the last administration of antibiotics.

Detection of these antibiotic residues can be accomplished in a properly equipped laboratory, and in order that the Department should be adequately informed of the level of residual contamination in milk being supplied to dairy produce factories, a survey is currently in operation of individual farm supplies. This has already revealed levels of penicillin which would be harmful to quality. Apart from actually testing for the presence of penicillin, a rather more positive approach has been adopted in some other parts of the world, where a coloured marker dye is added to all penicillin before sale. This discolours the milk for a period of up to three days, and if the farmer should by forgetfulness overlook the need to hold his milk, he is adequately reminded of the necessity for doing so.

Dairy farmers, irrespective of the source of supply of their milk and its ultimate usage, should adhere to the requirement that milk from penicillin treated cows should not be supplied for sale unless 72 hours have elapsed from the time at which the last dose of antibiotic was given.

No discussion of the chemical residues of milk and their effect on quality would be complete without a reference to the effects of hypochlorite which is commonly used as a sterilising agent.

As with antibiotics, excessive use of hypochlorite can have indirect, but quite positive detrimental effects upon the quality of the factory product. It has been demonstrated that hypochlorite if used in too high a concentration can retard starter activity.

Having examined the situation quite briefly, it should be clearly understood that it is not the intention of this article to in any way deplore the use of these aids to better farm husbandry methods. Indeed our general level of husbandry, and the quality of our dairy produce may not have been expected to have progressed as far as it has, had it not been for the introduction of these aids.

The main point at issue is to draw to the attention of farmers the absolute necessity to utilise these substances strictly in accordance with the manufacturers' directions, and if they are in any doubt, to consult someone who can speak with experience and authority. Familiarity breeds contempt and we are often too prone to unconsciously become a little lax in the use of many items which become a daily part of our routine.

In some circumstances, this is not important, but in the case of the subject under discussion, abuse of these items can have serious and far reaching effects upon the economy of the industry.