Section 5

Milk Quality
Residues in Milk

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Introduction

The person responsible for milk production on the farm must be aware of all of the chemicals that may leave residues in milk. These include detergents, disinfectants, flukicides and antibiotics. The dairy farmer is obliged to demonstrate that he or she is minimising or eliminating residues in milk at all stages of milk production.

1. How do I control trichloromethane (TCM) levels in milk?
2. How do I minimise iodine levels?
3. How do I prevent flukicide contamination?
4. How do I prevent antibiotic contamination?

Residues in Milk

A legal limit exists for trichloromethane (TCM) within the German market and is set at 0.1 mg/kg of product. While TCM levels in Irish products are well within this limit, competition between the different exporting countries means that for Ireland's product to be at the forefront, it is now necessary to have very low levels e.g. a TCM level in lactic butter of 0.03mg/kg or less.

For similar reasons, stringent standards require that iodine levels do not exceed 250mg/l milk. Critical to this standard is the absence of any form of veterinary drug residue, including flukicidal residues. Antibiotic residues, also cannot be present in milk and dairy products.

1 How do I control TCM levels in milk?

Key performance indicator

TCM less than 0.002mg/kg milk

TCM arises from interaction of detergent and sterilising solvents (containing active chlorine, used to clean milking and milk storage equipment) and milk. When chlorine in the detergent/steriliser comes in contact with milk, the chlorine binds to it and forms TCM. Thus, TCM develops within the detergent/steriliser solvent. This solvent is used and often re-used to clean and disinfect the milking and storage equipment. If this solvent is not removed completely from the equipment by effective rinsing, then TCM will be transferred to the milk that subsequently comes in contact with those surfaces.

- Select detergent/steriliser product from the Teagasc list (chlorine content <4%) and mix and use as recommended by the manufacturer.
- Drain all milk remaining in milk tubes/pipelines of plant after milking.
- Rinse with clean water (14 litres/cluster) and drain.
- Carry out the main wash cycle of the plant with detergent/sterilising solvent.
- Rinse plant again (14 litres/cluster) and drain.
- At the end of the second rinsing, no detergent should remain in the plant and the rinse water should run clear.
- The detergent/sterilising solvent should not be re-used more than once.
- Similar control measures must be used when washing the bulk tank.
- Dipping clusters in chlorine between cow milkings should be avoided - peracetic acid may be used instead of chlorine.

2 How do I minimise Iodine levels?

Key performance indicator

Iodine - Target <250mg/litre milk

The two main sources of iodine in milk are animal feed and teat disinfection products. Veterinary treatments/products may also contribute. Studies have shown a transfer rate of 30-40% of iodine between animal feed and milk, thus high iodine feedstuffs can result in dramatic increases in milk iodine concentration. Pre-milking disinfection of teats with iodine carries with it a substantial risk of direct transfer of iodine to milk, unless all of the iodine is carefully removed from the teats before cluster attachment.

How to

Avoid excess milk iodine

- If concentrate feeding levels of the cow need to be increased, use concentrates with lower iodine levels.
- Remove all traces of iodine from teats before milking cluster attachment.
- Mix and use teat disinfection iodine products as recommended.
- Carefully monitor veterinary treatment products containing iodine.

3 How do I prevent flukicide contamination?

A number of flukicide products such as those with the active ingredients: clorsulon, closantel, nitroxynil, rafoxanide and triclabendazole, do not have milk target levels set for them as yet, and therefore use of these products could result in problem flukicide levels in milk. Non-compliance with milk withholding periods after any flukicide product application to animals intended for milk production will lead to flukicide residues in milk.

Key performance indicator

Flukicides: none detectable

How to

Avoid flukicide contamination

Use a flukicide product selected only from the Irish medicine board (IMB) list. Adhere strictly to withdrawal periods as recommended for the product, especially in cases where cows calve-down early.

4 How do I prevent antibiotic contamination?

Key performance indicator

Antibiotics: none detectable

It has been estimated that over 70% of antibiotic residues result from the use of lactating and dry cow intramammary antibiotics. Failure to discard the milk from treated cows for the recommended period is the principal cause of antibiotic residues in milk. Contamination of milking equipment after milking a treated cow will also result in antibiotic residues in milk.

How to

Avoid antibiotic contamination

- Clearly identify antibiotic treated cows and record treatments on the parlour noticeboard.
- Discard milk for the recommended period.
- Separate antibiotic-treated cows from the herd and milk them last.
- Flush contaminated parts of the equipment after milking a treated cow.
- Dry cow product should be appropriate to the length of the dry period.