

Farm Dairy Instruction: Cleaning Milking Machines and Dairy Equipment

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THE milking machine and other equipment provide a serious source of contamination if effective methods of cleaning and sterilisation are not followed. Research and practical trials have shown that the detergents and methods advocated in this article are best suited to New Zealand requirements.

THE releaser type of milking machine, used by the New Zealand farmer, in which the milk is lifted to an overhead pipe by vacuum and released in a room separate from that used for milking, has considerably more metal and slightly more rubber than the bucket type of machine favoured in other countries.

It is difficult to formulate a complete method of cleaning the two component materials, metal and rubber, as a method best suited to cleaning metal may not be the best for rubber. For instance, regular brushing of metal is necessary to prevent the formation of encrustations of casein and minerals, but it will quickly destroy the surface of rubber and create conditions favourable to the harbouring of bacteria. Fat, including butterfat, is most destructive to rubber, and a detergent which will prevent milk film and deposits on glass and metal will not remove fat from rubber.

Milking machine rubberware will absorb fat rapidly; rubberware subject to pulsation will absorb half or more of its own weight within a relatively short period. Once fat is absorbed, destruction of the surface of the rubber begins and small cracks, which harbour bacteria, appear and get progressively worse until the rubber reaches a sponge-like condition in which it cannot be effectively cleaned or sterilised.

Porous Material Harmful

It is most important to remember that for handling dairy produce the use of anything porous must be avoided at all costs, because porous material harbours bacteria and makes sterilisation difficult and often impossible; wood or concrete in contact with milk will harbour immense numbers of bacteria. Metal must be smooth and properly coated with tin, and rubber must have a smooth, hard surface, if the conditions under which these materials harbour bacteria are to be avoided.

Because the milking machine is comprised largely of metal and rubber, both materials must be considered in reference to cleaning methods.

Research and trials by the Dairy Division have had as their objective



the formulation of a method which will prevent contamination from an accumulation of milkstone and mineral stone on metal, and intense contamination from deterioration of rubber by the penetration of fat.

As metal in good condition has a smooth, hard surface and presents no problem if simple cleaning methods (proper flushing, regular brushing, and sterilising with boiling water) are used regularly, the cleaning of rubber becomes the most important aspect. Rubber requires different treatment from metal, and usually it is the rubber parts of a milking machine which are found to be unclean because operators have not recognised the fundamental cause—absorption and penetration of fat. The objective should be to use a detergent and a method of cleaning which will retard the penetration of fat into rubber and the consequent destruction of its interior surface. Exhaustive trials, supported by analyses of rubber after use, show that an alkaline wash is best, the most effective detergent being caustic soda, not because of its strength as a cleanser, but because of its ability to remove all trace of fat by its power of binding fat particles.

The metal and rubber on a milking machine may be in good condition, but if proper cleaning methods are not used regularly or the cleaning procedure is unsatisfactory, contamination and consequent harbouring of bacteria will arise from two conditions: The formation of encrustation of milkstone and mineral stone on metal and the penetration of fat into rubber.

Milkstone is the casein of milk which has become attached to metal in the form of encrustations. It is caused by inefficient flushing of the milk from the equipment, the casein of the milk being burnt on to the metal by the heat generated by the subsequent boiling flushing solutions. Mineral stone is caused by small deposits of minerals common in some water lodg-

ing on metal. They occur first as sediment and finally become firmly attached by heat and a mixture of milk deposits, including fat.

These conditions, both of which are a serious contaminating influence, can be avoided by sufficient flushing and regular brushing.

Rubber is not affected by milkstone because it does not absorb and hold heat as does metal. The rubber parts of a milking machine should not be brushed, because it is unnecessary and because the regular use of a brush will scratch and score the inside surface, assisting in the lodgment and penetration of fat and causing a porous condition, which should be avoided.

All metal parts used in handling dairy produce should have a bright, shining appearance. If dull, they are coated in deposits or have lost tinning. The former can be removed with spirit of salt, but metal devoid of tin must be replaced.

Milking Machines

On the modern and larger milking machines a self-draining vacuum tank is fitted next to the vacuum pump to facilitate the cleaning of the milk and air systems by flushing. The top chamber of the releaser is filled with liquid by interrupting the releaser pulsator and the surplus taken to the vacuum tank, thus cleaning the vacuum piping in this section. The liquids are discharged by breaking the vacuum at any point on the machine, and the method has the advantages of conveniently flushing both the milk and air systems and of assisting to maintain the temperature of the solutions used.

A simple method of cleaning a milking machine is described in the following section of this article, but it must be practised regularly. Where this is