

ABNORMAL MILK CONTROL AND THE SANITARIAN

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The Grade "A" Pasteurized Milk Ordinance—1965 Recommendations of the United States Public Health Service contains 21 separate items or sanitation requirements for Grade "A" raw milk for pasteurization. These are known as the "r" Items of Section VII and refer to raw milk as opposed to the "p" Items of Section VII which refer to pasteurized milk.

Questioning of sanitarians in several areas of the United States would seem to indicate that more than 95% of the sanitary inspections of producer dairies are made at other than milking time. Exceptions are found in those areas with extremely large dairy herds which milk up to 20 hours per day. In these areas, the majority of the sanitary inspections are made at milking time.

There are four of the "r" Items which can be observed only at a milking time inspection. These are Item 13r, Utensils and Equipment - Handling; Item 14r Milking - Flanks, Udders, and Teats; Item 16r Milking - Transfer and Protection of Milk; and Item 18r, Personnel Cleanliness. In addition to these four items, there are two other items which are more practical to observe during milking time inspections. Compliance with Item 11r, Utensils and Equipment, is difficult to determine unless the sanitarian is there to observe and judge the application of the sanitizing procedure. Swab tests of the utensils can be run by the laboratory to determine the effectiveness of the sanitizing procedure. But how often is this done?

A similar condition exists relative to Item 1r, Abnormal Milk. Laboratory tests are necessary to determine compliance with portions of this item relating to adulteration with antibiotics, pesticides, or radionuclides. During a milking time inspection the sanitarian can make an immediate check for abnormal milk due to mastitis. Approximately 25% of the mastitis cases result in milk which is grossly abnormal. Any evidence of flakes, clots, blood, or other abnormal secretion on the strainer pad is indicative of non-compliance with Item 1r. To detect the other 75% of the mastitis cases, laboratory or special test equipment is required. In addition, Item 1r requires that "equipment, utensils, and containers used for the handling of abnormal milk" shall not be "used for the handling of milk offered for sale, unless they are first cleaned and effectively sanitized."

SANITARIAN'S ROLE IN ELIMINATING ABNORMAL MILK

The marking of an inspection form and posting of it in the milk house does not complete the work of a conscientious sanitarian. Whenever possible, he should explain any demerits or checks to the dairyman. He should also be able to advise the dairyman on how to correct his deficiencies.

The problem of bovine mastitis is the major disease entity faced by most dairymen today. Mastitis is costly from an economic standpoint to the producer, the inflammatory by-products of mastitis are aesthetically undesirable, and many of the causative agents of infectious mastitis are inimical to the health of the consuming public. Many dairymen are seeking a way out of the dilemma of bovine mastitis. The observant sanitarian, with a little bit of extra time, often sees errors in milking practices or can spot signs of malfunctioning milking equipment.

Some of the things that a sanitarian can observe during milking time inspections are listed below. These are not violations *per se* of the Grade "A" Pasteurized Milk Ordinance—1965 Recommendations of the United States Public Health Service, but their occurrence often contributes to the increasing incidence of mastitis. Very often malfunctioning equipment or poor milking practices have an insidious onset and the dairyman is unaware of their presence. He may well appreciate an alert sanitarian informing him of these trouble spots.

MILKING PRACTICES

Factors of importance which should be observed and checked during the milking procedure are:

Use of strip cup or strip plate—This seems elementary but many dairymen omit this practice in an effort to shorten the milking time. If the dairyman is going to withhold all abnormal milk from the milk supply, he must examine the milk from each quarter prior to milking.

Time interval between udder massage and application of the milker—Milk let-down occurs approximately 30-60 seconds following udder massage. Failure to take advantage of milk let-down could lead to incomplete removal of milk from the udder and to increased milking time.

Teat cup crawl—This may be caused by the use of wide-bore inflations on young cows but the more probable causes of teat cup crawl are excessive vacuum or leaving the milking machine on after the udder is empty. The latter practice tends to cause the sides of the teat cistern to rub together resulting in injury to the teat lining. Injured tissue is, of course, much more susceptible to infection than healthy tissue.

Prolonged machine stripping—The average cow should machine strip in 15-20 seconds. A few so-called "hard milkers" are exceptions to this rule. As with teat cup crawl, excessive machine stripping may irritate the lining of the teat and predispose that quarter to infectious mastitis.

Method of removal of the teat cups—Merely pulling off the inflation at the completion of the milking act puts undue stress on the teat resulting in irritation. The vacuum should be broken prior to removal of the teat cup. This is accomplished by use of a shut-off valve or by depressing the lip of the inflation with the finger to permit the entry of air.

Disinfection of teat ends following milking—The drop of milk on the teat end following milking is an ideal media for bacterial growth. Most dairy specialists recommend that the teat end be dipped in a solution of chlorine, iodine, or quaternary ammonium compounds following milking to reduce the potential for bacterial growth.

Rinsing and sanitizing of teat cups between cows—It appears redundant to say that teat cups should be sanitized between cows to reduce the spread of infectious organisms. Yet this step is omitted by many dairymen. The inflations should first be rinsed in a bucket of clear water and then dipped in a sanitizing solution. As with all sanitizing operations, its effectiveness is increased with longer exposure to the sanitizing agent.

Number of milking units per milker—Generally speaking, the average milker can properly handle no more than two bucket type units in a stanchion barn or three pipeline milking units. When more than the recommended number of milkers are being used, you will generally find that one or more other items are also being violated.

MILKING EQUIPMENT—INSTALLATION

Proper milking cannot be accomplished without good equipment properly designed and installed. The following items are important:

Check the size of the vacuum line—Under sized vacuum lines result in insufficient vacuum level at

the milker. This, in turn, prolongs the milking act and predisposes the udder to mastitis. The Milking Machine Manufacturers Council recommends the following minimum sizes of vacuum lines:

- a. 1" lines—up to 3 milking units.
- b. 1¼" lines—up to 6 milking units.
- c. 1½" lines—up to 10 milking units.

Check vacuum line installation—Dairy engineers recommend that the vacuum line be a continuous loop in double row stanchion barns rather than having two dead ends. Should dirt or milk cause a partial plug in a line with a dead end, all vacuum outlets between the plug and the dead end would have insufficient vacuum. The continuous loop would bypass one partial plug in the line.

Check the location of the vacuum controller—The vacuum controller should be located between the first stall cock and the vacuum pump in bucket type installations. In pipeline installations, the controller is usually located very close to the milk receiver. Some installations use more than one vacuum controller and the additional controllers or regulators may be located at other points in the vacuum line.

Problems related to equipment should be referred to a well qualified milking machine representative or extension dairy engineer for correction. Unless the sanitarian has had special training in milking machine installation, he should only advise the dairyman that a problem exists and he should seek qualified help.

MILKING EQUIPMENT—OPERATION

Some adverse conditions due to faulty operations of the equipment may affect the milking. Points to be carefully observed are:

Check the milking time per cow—With few exceptions, the average cow should be milked out in 2½-4 minutes. Longer milking times may indicate low vacuum, too many milking units per man, or over-milking.

Do the teat cups fall off frequently during milking?—If they do, the vacuum level is probably inadequate. Another possibility is inadequate vacuum reserve. The sharp reduction in vacuum when air is admitted into the line permits the teat cups to fall off.

Are the cows uneasy while being milked?—Do they appear to tread or dance as though they are nervous or uncomfortable? Do they kick at the milking unit? An occasional heifer may exhibit these actions because she is untrained or an occasional cow may have acute mastitis resulting in a painful milking procedure. If several of the cows exhibit this type of

action, the vacuum level is probably too high and the milking procedure is painful.

Observe the vacuum gauge—Wide variations in the vacuum level or a slow return to the proper vacuum following the entrance of air into the line are probably due to an inadequate vacuum reserve or an inadequately sized vacuum pump.

Check the vacuum regulator—These are sometimes called relief valves or vacuum controllers. They are designed to permit atmospheric air to enter the vacuum system at a preselected level of vacuum. You should hear the hiss of atmospheric air entering the system except during peak demand times. The absence of sound of air entering the system through the vacuum controller or regulator is probably due to a sticking regulator or an inadequately sized vacuum pump.

ENVIRONMENT

Other factors which may have a bearing on good dairy farm operation are:

Construction defects—High door sills have a bad reputation for causing udder injury and subsequent mastitis. Wherever found, the dairyman should be encouraged to correct them. Steep ramps leading to some milking parlors are also responsible for many udder injuries. The ability of the cattle to obtain traction on ramps can best be judged when the ramp is wet.

Stanchion size—Inadequately sized stalls in stanchion barns are responsible for many self-inflicted udder injuries, especially to the teats. This defect is common on dairy farms which have changed over from one of the smaller breeds of dairy cattle to one of the larger sized breeds without remodeling the barn interior. Often too, we will see an increase in size of progeny within a breed as a result of improved breeding and feeding programs. The county agricultural agent should have literature from the State Agri-

cultural Extension Service on the proper sizing of stalls.

SUMMARY

Several of the "r" items of Section VII of the Grade "A" Pasteurized Milk Ordinance—1965 Recommendations of the United States Public Health Service are peculiar to milking time inspections. Milking time is the ideal time to determine the dairyman's compliance with regard to Section 7, Item 1r, Abnormal Milk. In addition to the regular inspection, the sanitarian can make several observations of the milking operation and equipment at this time which will aid the dairyman in his fight to control abnormal milk.

When apparent defects are noted in the operation or installation of milking equipment, the sanitarian should recommend that a qualified milking machine serviceman be engaged to check the system and correct any deficiencies. In some areas, the State Agricultural Extension Service has the equipment to analyze the milking system and they will work closely with any dairyman who requests their aid.

The conscientious sanitarian does not need a lot of expensive equipment to help the dairyman overcome the abnormal milk problem. He can help the dairyman considerably by using his powers of observation during a milking time inspection.

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