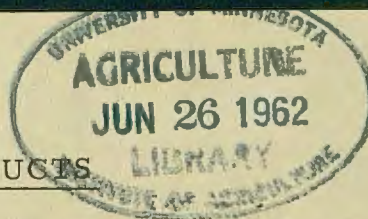


Minnesota

Dairy Products Processor

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STAPHYLOCOCCI IN DAIRY PRODUCTS

One of the groups of bacteria that may be found in dairy products is called staphylococci. Occasionally, a specific strain of *Staphylococcus aureus* is implicated in an outbreak of food poisoning. Foods such as poultry, ham or other meats, salads and sandwich spreads, cream or custard pies are frequently involved. Controlling the growth of this organism in dairy products is essential.

Research on this problem has been going on in our Dairy Industries Department and some of these findings as well as those of other investigators are included in the following summary.*

HOW DOES THE PROBLEM DEVELOP?

The *S. aureus* problem is unique because pasteurization, which destroys the organism, does not necessarily prevent its ill effects. If allowed to grow in raw milk (or in pasteurized products recontaminated with the bacterium) an enterotoxin may be formed and excreted by the cell. An enterotoxin is an intestinal poison. This poison, then, is extremely heat stable. Pasteurization destroys the organism, but the toxin remains.

CONDITIONS FAVORING PRODUCTION OF THE TOXIN

The optimum growth temperature for *S. aureus* is about 100° F. It can grow at temperatures ranging from 50° to 120° F., although slowly up to 60° F.

Unlike many bacteria *S. aureus* can grow in a medium of high osmotic pressure (high sugar or salt concentration). Forty-five percent solids condensed milk or up to 10 percent salt (NaCl) will allow growth.

Difficulty in defining precisely the conditions of maximum toxin production arises from the lack of a suitable test for determining the presence of enterotoxin. Reliable evidence of toxin must be obtained through use of human volunteers.

CONTROLLING THE GROWTH OF STAPHYLOCOCCI

The problem begins on the farm. Mastitis caused by staphylococci is now more prevalent than ever due to (1) elimination of other competing mastitis organ-

* Taken from the article by J. J. Jezeski and J. C. Olson, Jr., "Staphylococci in Dairy Products," Minnesota Farm and Home Science, Vol. XIX, No. 2-Winter 1962.

isms (streptococci) by antibiotic treatment and (2) ability of staphylococci to develop antibiotic resistance. To control staphylococci on the farm:

1. Use mastitis control procedures. Sanitize udders before milking, use strip cups, use mastitis tests, and/or veterinary service.
2. Keep equipment clean. This prevents spread of the organisms and stops growth of those that are present.
3. Withhold milk from cows having mastitis.

In the dairy plant staphylococcus growth can be minimized by:

1. Quick pasteurization of milk even though further processing is anticipated (particularly true for dry milk operations because normal processing techniques may allow staphylococcus growth).
2. Proper cleaning and sanitizing of equipment, especially post-pasteurizing equipment to prevent recontamination.
3. Avoiding prolonged storage or handling of dairy products at temperatures between 50° and 120° F.

CONTROLLING STAPHYLOCOCCUS AUREUS IN THE CHEESE INDUSTRY

Cheese industry problems in controlling staphylococci are somewhat unique because (1) sub-pasteurization temperatures are commonly used to promote maximum flavor development and (2) processing and curing temperatures are frequently within the range of staphylococcus requirements and (3) the possibility of recontamination of heat treated or even pasteurized milk during cheese processing is somewhat greater than for other dairy products.

Research in S. aureus problems in cheese making indicates:

1. Heat treatment normally given milk to be processed into cheese (145-150° F. for 14 to 21 seconds) markedly lowers the S. aureus count and would appear to eliminate any health hazard.
2. Growth of S. aureus both during normal processing and when starter activity is inhibited is rapid up to 24 hours after beginning manufacture.
3. Aging of cheese made from milk having S. aureus contamination provides little or no protection. The count remains high for months.
4. S. aureus dies off more slowly in cheese stored at 40° F. than at 50 or 60° F.

With current methods of handling and processing, S. aureus poisoning from dairy products should not be encountered. Under unusual circumstances, problems can develop and our constant attention is needed to completely eliminate this health hazard.

NEW INSECTICIDES AND INSECTICIDE USES

Dimethoate ("Cygon") is a phosphate residual spray. It can be used in dairy barns and has fairly long residual action.

DDVP can now be sprayed on dairy cattle. Previously it was applied only as a face fly bait. But John Lofgren, Extension Entomologist, has pointed out that it must be applied very carefully, accurately, and precisely. It is effective in the control of house flies, mosquitoes, horn flies, face flies, and stable flies.

It is generally available as a 1 percent solution in oil and should be used as a mist spray at a maximum rate of 2 ounces per head per day. Accurate measurement of the dosage is essential and calibrated sprayers will have to be used.

To apply most effectively, spray the cow over that part of the body being attacked...for face flies, the head and neck; horn flies, the shoulders and back; stable flies or horse flies, the legs and sides.

Although the 2-ounce dosage can be split 1 ounce in the morning and 1 in the evening it is recommended that the 2 ounces be applied in the morning after milking.

DDVP can be used as a dairy barn fogger in a 1-percent solution at a rate of 1 pint per 8,000 cubic feet.

FOR MILK HOUSE, STORAGE, OR PROCESSING AREAS:

Several new chemicals have been approved for use in milk rooms. However, it is still recommended that pyrethrum space sprays be used exclusively unless extreme precautions are used in applying other chemicals. A thorough job of spraying around the outside of the milk house and in the barn should limit the need for milk house spraying. The few flies that gain entrance can be controlled with the pyrethrum spray.

BARN CHARTS

Last year barn charts were prepared indicating the proper use of various insecticides. The information is not outdated and a few charts are available for producer use. Contact the Bulletin Room, University of Minnesota, St. Paul 1, Minnesota.

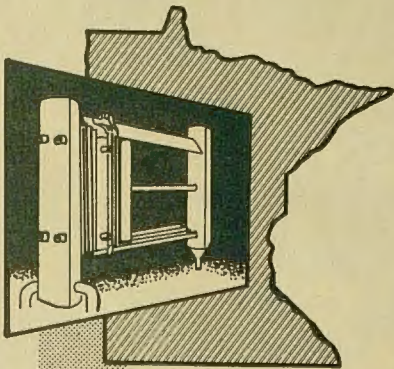
DON'T GET TAKEN IN!

Some illicit insecticide sales tactics may be in use throughout the state, according to John Lofgren, Extension Entomologist. The representative of the insecticide company may tell you that your product has been found to contain insecticide residues. Ask to see the credentials of any individual making such statements. He may be simply trying to scare you into buying his product or promoting its use among patrons.

Some insecticides are being mislabeled or misrepresented as being the only legal insecticide for use on cows or in barns. Don't believe it.

DAIRY PRODUCTS INSTITUTE--SEPTEMBER 11, 12, and 13

We hope you will plan to attend the Dairy Products Institute this year. Discussions of management problems, laboratory analyses, quality control, and product processing problems will be presented. We think you will find something of interest at all sessions and hope you will take the opportunity to be with us.



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