

Mastitis Control Program for Strep. Ag.-Infected Dairy Cows

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Streptococcus is a general name for a class of bacteria capable of causing mastitis (inflammation of the udder) in dairy cows.

Streptococcus agalactiae, also called *Strep. ag.*, is the most common cause of non-clinical mastitis infections of cows within a dairy herd. *Strep. ag.* causes approximately 40 percent of **all** mastitis infections.

This bulletin will focus on the source of *Strep. ag.* infections within a dairy herd, and suggest useful control and prevention tips for dairy farmers.

Where can *Strep. ag.* be found on the farm?

Infected cows are the source of *Strep. ag.* Though it can survive indefinitely within the mammary gland, *Strep. ag.* survives only a short time outside the mammary gland. Cows infected by *Strep. ag.* usually have at least two infected quarters.

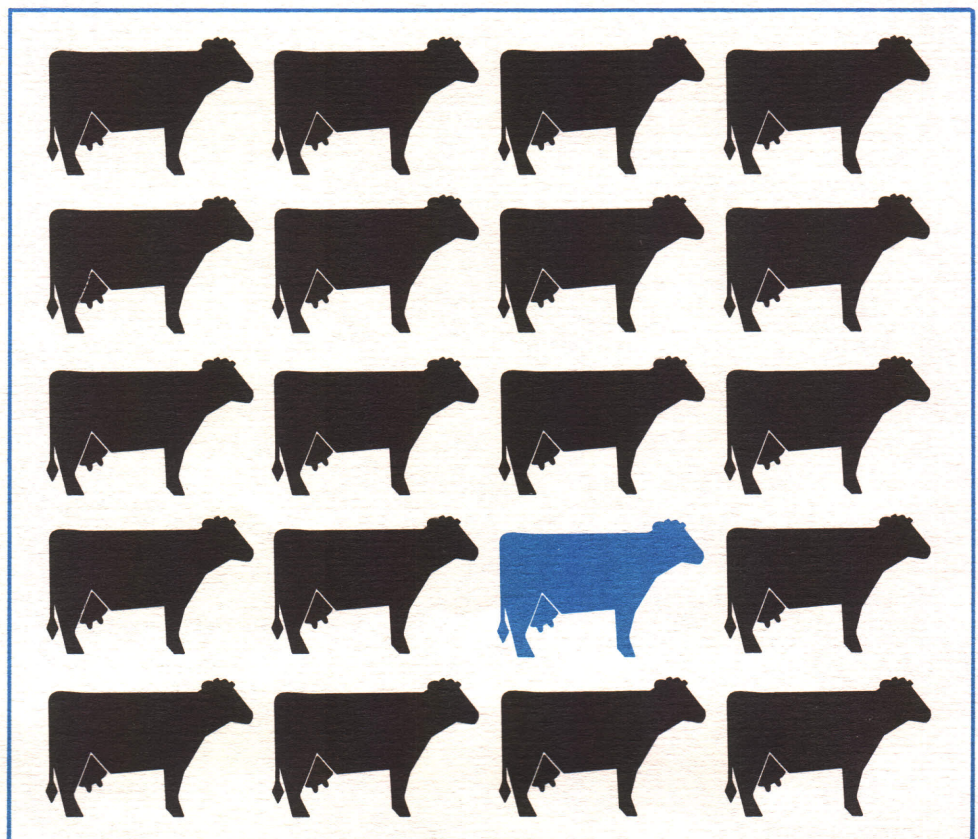
How could *Strep. ag.* infections develop and spread within my herd?

Purchasing *Strep. ag.*-infected cows and adding them to a *Strep. ag.*-free herd can result in a majority of cows becoming infected within a few months.

Infections can also develop among group-penned heifer calves.

A calf's mammary gland may become infected with *Strep. ag.* if it is suckled by a second calf that has been fed whole milk from an infected cow. The infection can then remain indefinitely in the newly infected heifer's mammary gland.

Infections are spread from infected cows to non-infected cows during milking via milking machines, contaminated milkers' hands, and common wash materials such as rags and sponges.



A dairy farmer may be treating only one clinical case of Strep. ag.-mastitis when there are actually 20 cows infected.

How widespread can a *Strep. ag.* problem be within a herd, and how severe are the results from such an infection?

It is not unusual to find 60 to 80 percent of cows within a herd infected by *Strep. ag.* The majority of these cases are non-clinical; in fact, *Strep. ag.* infections account for only 2 percent of all clinical mastitis treatments. It has been estimated, however, that a dairy farmer may be treating **only one case** of clinical mastitis for each 20 to 40 quarters or cows that are actually infected.

Strep. ag. infections are usually relatively mild when measured in terms of udder swelling, systemic health problem or quarters lost, though infections can become severe enough to result in the death of a cow. Normally, *Strep. ag.* infections do not result in acute mastitis cases.

What effects does *Strep. ag.* have on milk quality and production?

Strep. ag. is considered the leading cause of illegal somatic cell counts in bulk tank milk (counts greater than 1,000,000). In addition, some illegal bulk tank bacteria counts (greater than 100,000) can be traced to *Strep. ag.* infections.

As somatic cell counts rise, milk quality decreases, because milk solids such as lactose and casein decrease. Milk production from a cow with an infected quarter may decrease as much as 40 percent without the cow's showing apparent clinical signs of mastitis. A reduction in milk quality ultimately leads to increased income losses for the dairy farmer who bases his or her milk sales on component pricing or who is paid a premium for higher quality, lower cell count milk.

What are some indications of a *Strep. ag.* problem that I might recognize in my herd?

- Bulk milk tank or DHIA weighted somatic cell counts that are consistently between 600,000 and 1,000,000 or higher (linear score of 6 or higher) and only 60 to 70 percent of your herd showing cell counts of less than 400,000 (linear score of 5). The clinical infection rate among your herd will probably remain low

(1 to 2 percent), including any cows that have linear scores of 8 or higher.

- Heifers freshening with "blind" (non-functional) quarters.
- A decrease in herd milk production, despite good general herd management.
- Illegal bacteria counts greater than 100,000 in bulk tank milk, even when you are using clean equipment, good washing procedures and proper cooling methods.
- What appears to be a good response by clinical mastitis cases treated with penicillin or synthetic penicillin.

Keep in mind that no cow is immune to *Strep. ag.* Infections can develop in cows at any age and during any stage of lactation. And because most *Strep. ag.* infections are non-clinical, there will be no visual signs that will pinpoint differences between *Strep. ag.* and another organism that may be causing a mastitis infection, such as *Staphylococcus aureus.*

What should I do if I recognize some or all of these situations within my herd?

First, determine whether your herd has a *Strep. ag.* problem. Collect sterile milk samples for culture tests from 15 percent of your herd (or at least 10 to 20 lactating cows) selected at random, or from a minimum of 20 cows with somatic cell counts of 400,000 or higher (linear score of 5). Have the samples cultured by a qualified microbiological laboratory. Your veterinarian may have the proper lab facilities, or you can submit samples to your state animal health diagnostic lab or your milk producers' association. Costs for culture tests may range from \$1 per cow to \$10 per culture, depending on the organism responsible for the infection and the laboratory involved.

What will the results of the culture tests from my milk samples tell me about a possible problem within my herd?

Positive results of 30 to 40 percent or more of the milk samples you had tested for *Strep. ag.* would indicate a significant non-clinical mastitis problem within your herd.

Each cow with a somatic cell count greater than 300,000 should be considered infected. If cell counts are high but the milk is negative for *Strep. ag.*, other organisms are probably responsible for the high cell counts. Culture tests will identify these organisms, and you can then begin appropriate control procedures.

If culture tests indicate that more than one type of organism besides *Strep. ag.* is responsible for mastitis infections within your herd, consult other bulletins within this mastitis control series to determine appropriate control procedures for infections caused by those organisms.

What management steps should I take to solve a herd mastitis problem caused predominantly by *Strep. ag.*?

There are several options to choose from in managing your *Strep. ag.*-infected herd. The urgency of your situation should dictate how quickly you begin an action program.

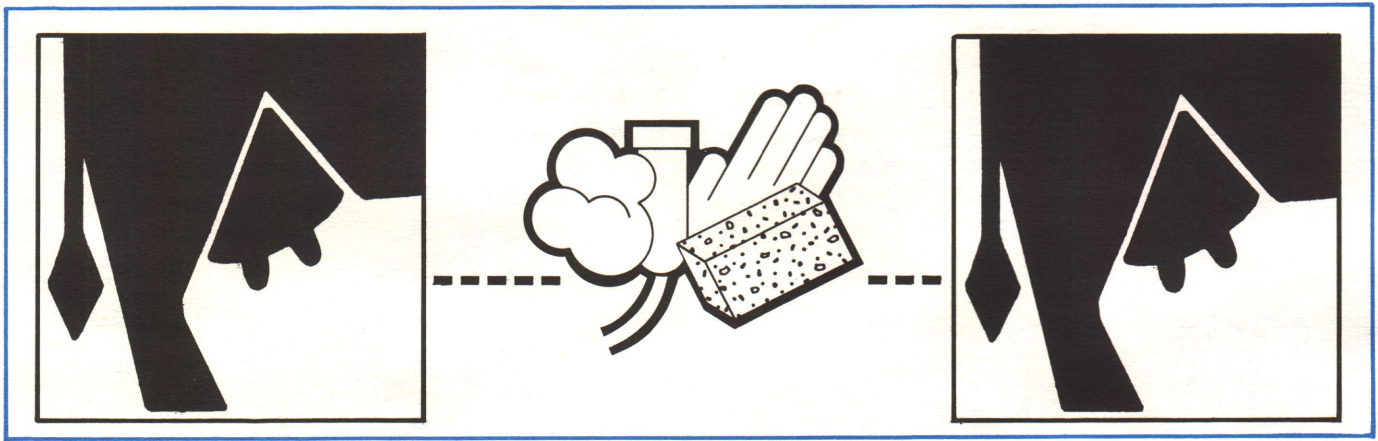
1) Emergency Program: If the last two out of four consecutive bulk milk somatic cell counts were 800,000 or higher, and high counts were a result of *Strep. ag.*-infected cows, you need to begin an action program immediately. Consider following action program #1 to avoid suspension from the milk market.

2) Short-Term Program: If your last several bulk tank or DHIA cell counts were low but there is still an indication of *Strep. ag.* infections within your herd, you may wish to implement action program #2.

3) Long-Term Prevention/Control Program: If you are interested in keeping a mastitis problem from recurring once it is under control, you would be wise to go with program #3 IN ADDITION to either the emergency program or the short-term program.

Action Program #1 (Emergency)

Example situation: Based on culture tests, 80 percent of your herd has *Strep. ag.* infections. Your last four bulk tank somatic cell counts



Strep. ag. is often transferred from an infected to a non-infected cow during milking routines via rags and sponges, milkers' hands, or contaminated teat cup liners.

have averaged 1,000,000. In addition, your herd production has been running at about 40 pounds or less per cow.

What should I do?

Set up an intensive *Strep. ag.* eradication program. This program will include treatment of **all cows** and **all quarters**. Be sure to contact your milk cooperative and inform them of your plans to begin treatment. Consult with your local veterinarian before beginning any treatment on your herd. In addition, start developing a long-term mastitis control program (see action program #3).

DAY 0—Cull any cows five years old and older that have these characteristics:

- 1) Positive culture results for *Strep. ag.* infections.
- 2) Somatic cell counts of 1,600,000 or higher (or linear score of 7 or higher) for three or more months.
- 3) A previous history of chronic clinical mastitis or cell counts that exceed 2,000,000.

In addition, dry off any cows that are within 80 to 90 days of freshening.

DAY 1—In consultation with your veterinarian, treat all quarters of all lactating cows with a commercially available, prepackaged drug formulated for lactating cows. (Penicillin is the preferred drug.) Follow directions on the drug label for proper treatment schedule. Cows that are within 80 to 90 days of freshening should be similarly treated with an

approved drug that is designed especially for dry cows.

DAY 2—Continue proper treatment schedule according to label directions before beginning next step. At the end of the last treatment, begin prescribed withdrawal period. (NOTE: last treatment may not necessarily fall on Day 2.)

DAYS 4-6—Following prescribed withdrawal period (approximately 72 hours) for drugs administered Days 1-2, begin re-entering milk into tank. Have your milk cooperative collect a milk sample from the tank after the first two milkings to check for presence of antibiotics.

DAY 21—Reculture complete herd plus any heifers or cows that have freshened since Day 0.

DAYS 24-25—Based on culture results of samples taken on Day 21, re-treat (with same drug, as per Day 1 instructions) any cows that test positive for *Strep. ag.* and any cows with cell counts greater than 400,000 (linear score of 5). Keep your milk cooperative informed of the progress of your treatment program. You may ship milk from cows that were cultured negative and that show cell counts less than 400,000.

DAYS 28-31—Repeat schedule from Days 4-6 for cows that tested positive for a second time. Be sure to follow the prescribed withdrawal period.

DAY 46—Resample cows treated on Days 1 and 24-25, as well as heifers

and dry cows that have freshened since Day 21. Any heifers and/or dry cows that culture positive for *Strep. ag.* should be treated according to instructions on Days 1 and 24-25.

What should I do with cows that do not respond after two series of treatment?

Based on the culture results of samples taken on Day 46, cows that culture positive for the third time and/or that do not respond to antibiotic therapy should be culled.

Culling non-responsive cows may be the best solution to eliminating a chronic *Strep. ag.* infection, but cash flow problems may require you to consider other solutions. If you must keep chronically infected cows in your herd:

- Milk them last, in a group separate from the rest of the herd.
- Dry treat them at the end of lactation, and reculture by Day 5 of the next lactation. Cows that remain positive for *Strep. ag.* for a second lactation should be culled immediately or milked last for the rest of their productive life.

Even if I carefully follow a treatment plan, is it still possible for my herd to get reinfected? If so, how?

One cow with a *Strep. ag.* infection can reinfest the majority of the herd within a few months. Thus, you really cannot afford to maintain even one *Strep. ag.*-infected cow in your whole herd.

Once *Strep. ag.* infections are eliminated from a dairy herd, the only way reintroduction can occur is

through the purchase and addition of infected heifers and/or cows to the herd.

Action Program #2 (Short-Term)

Example situation: Half (50 percent) or less of your herd is infected with *Strep. ag.*, and/or your herd's bulk tank DHIA weighted somatic cell count has been ranging from 400,000 to 600,000. You have confirmed cases of *Strep. ag.* infections.

What should I do?

If you have not already done so, have your complete herd cultured to identify all infected animals. With this action program, complete herds are not treated—only cows that culture positive for *Strep. ag.* or that have somatic cell counts greater than 400,000 (linear score of 5 and above).

DAY 0—As with action program #1, identify and cull all cows that have a long-term history of mastitis and a continual cell count of 1,600,000 (linear score of 7 or higher). In addition, dry off and dry treat all cows that are within 80 to 90 days of freshening.

DAYS 1-46—Follow the same treatment program described for Days 1-46 of action program #1. In addition, begin long-term control program (action program #3).

It is extremely critical **TO SEGREGATE TREATED COWS AND MILK THEM LAST.** Do not attempt to use "blitz" therapy—treatment of the entire herd—for short-term control of *Strep. ag.* if you cannot segregate cows that need to be treated.

Action Program #3 (Long-Term Prevention & Control)

Example situation: You have several confirmed cases of *Strep. ag.*-infected cows but relatively few clinical cases. In addition, your herd's bulk tank or DHIA weighted somatic cell count has been averaging 300,000 to 400,000 (linear score of 4 to 5).

What should I do?

Begin a long-term prevention/control program that includes basic management steps and recommends lactation therapy only as needed.

In addition, this program contains valuable suggestions for preventing a *Strep. ag.* problem from recurring once it is alleviated.

Generally, the dairy farmer described in the above situation is not in trouble with the milk market, and a majority of cows in the herd are not infected. In this type of situation, *Strep. ag.* infections can be eliminated from the herd over a two- to three-year period.

Is a long-term program really that important?

As we have emphasized throughout this bulletin, a short-term program may improve a current problem, but unless a long-term program is started at the same time, the *Strep. ag.* problem you worked so hard to get rid of this year may return in full force next year.

Consider following these steps toward long-term prevention of a *Strep. ag.* mastitis problem within your herd:

- Cull chronically infected cows that continually show somatic cell counts greater than 1,000,000 (or a linear score of 6 or higher).
- House calves individually when you feed them whole milk.
- Culture newly purchased cows before adding them to the milking string.
- Culture milk from purchased, bred heifers for presence of *Strep. ag.* by six days postpartum before adding them to the milking string.
- Use well-designed milking equipment correctly, and keep it well-maintained. Overused inflations, grossly undersized vacuum pumps and malfunctioning pulsators can play a major role in aiding transfer of *Strep. ag.* infections from cow to cow.
- Follow a carefully planned milking routine to decrease the possibility of transferring infections during milking. Washing and drying teats for prepping should take a minimum of 20 to 25 seconds. Attach milking machine within 30 to 60 seconds after you finish prepping. At the end

of the milk flow, use a positive vacuum-shutoff before removing the milking machine.

Teat dipping should be a regular part of your milking routine. Apply a post-milking sanitizer after removing the machine, making sure to cover at least 50 percent of each teat.

- Dry treat all quarters of all cows with an antibiotic formulated specifically for dry cows.
- Segregate known infected cows and milk them last.
- Use DHIA or a similar somatic cell count program to monitor each cow every month.
- Culture cows that have clinical mastitis and treat according to your veterinarian's instructions.
- Sample the bulk tank periodically to monitor for *Strep. ag.* once an infection problem is under control.
- Cooperate with your local veterinarian to establish *Strep. ag.* control and prevention programs.

SOMATIC CELL COUNTS AND EQUIVALENT DHIA LINEAR SCORES

Average Somatic Cell Count	DHIA Linear Score
12,500	0
25,000	1
50,000	2
100,000	3
200,000	4
400,000	5
800,000	6
1,600,000	7
3,200,000	8
6,400,000	9

This is one in a series of bulletins on mastitis control in dairy herds. Contact your county Cooperative Extension Service office for information on other forms of mastitis and how to control them.

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