



SCC DIAGNOSTICS TOOL BOX

QCF-10: Cold Weather Teat Dipping

Jeffrey K. Reneau
Department of Animal Science
University of Minnesota, St. Paul

It is frequently asked during the winter months, particularly on cold free-stall dairies in Minnesota... “Should I continue to dip teats during severe cold weather?”... or “Under what conditions should I stop teat dipping to avoid frozen teats?” It is difficult to give a single answer as there are many variables (housing design, weather conditions, degree of teat exposure, etc.) that must be considered.

Consistent use of an effective teat dip is a very important mastitis control procedure. In stall barns or warm free-stall units where ambient temperatures do not get below freezing, teats of all cows should be dipped after each milking every day of their lactation. Yet wintertime conditions in the northern dairy states present challenges for proper teat dip management. Below freezing temperatures may cause the teat dips themselves to become frozen when stored in uninsulated, unheated buildings or during transportation to the farm. It has been shown that the active ingredients of some teat dip solutions may precipitate or partially precipitate out of solution as a result of freezing and subsequent thawing, thus concentrating the active ingredients in the lower levels of the storage containers. Use without re-suspending the precipitated ingredients by thorough mixing may result in either teat dip solutions that have an ineffective disinfectant concentration or teat dips in concentrations so strong that teat irritation occurs.

Except in cows or heifers with udder edema or those that may be severely debilitated, teats are not affected by the typical cold experienced in sheltered, cold free-stall housing if teats are completely dry. However, severe cold temperatures combined with the effect of wind can result in frostbite even when the teat is dry (Figure 1). Therefore, any time cows exit a parlor into cold weather conditions in which the combination of cold and wind result in wind chills of -25°F (Table 1 and Figure 1), preventive steps need to be taken. Ample amounts of dry bedding material should be placed in free-stalls. Construction of effective windbreaks is very helpful in minimizing the effect of cold on teat skin surface. Note that at wind speeds of 5 mph or less, temperatures as low as -20°F can be tolerated. However, with extremely high winds (35 mph) and temperatures as high as 15°F , wind chill could be a problem.

It should be kept in mind that the information for Table 1 was extrapolated from human data. The wind chill in those studies was expressed as the rate of heat loss per unit of exposed human skin. Since the normal body temperature of dairy cattle is 101.5°F and not 98.6°F as in humans, the wind chill factor at which exposed teat skin will freeze may be slightly different than skin on human hands or face. Other factors that play a role in the ability to resist frostbite are the degree of health, level of exercise, whether or not the sun is shining, etc. However, the extrapolation is adequate to develop some guidelines to assist dairymen with teat dip management during winter conditions.

Wet skin or skin surfaces that are frequently washed with loss of some of the natural oils are more vulnerable to frostbite than skin that is kept dry. Thus, the question of how to manage teat dip use during winter is a logical question from the concerned dairy farmer. The most commonly employed solution is to stop teat dipping entirely. It could be reasoned that during severe cold, bacterial growth on teats and in the environment is much less; therefore, teat disinfection is not quite as crucial during those periods. However, in some regions of the northern United States the complete cessation of teat dipping during the cold winter months has allowed the spread of contagious mastitis pathogens. In addition, it should be pointed out that omitting teat dipping does not assure that teats are dry. In severe cold, even the thin milk film should be dried before the cow is turned out of the parlor.

A more preferable option is to teat dip every cow regardless of weather conditions, BUT under severe cold conditions (Figure 1) allow 30-second contact time and then wipe teats dry prior to leaving the parlor. This procedure would add approximately 20 seconds per cow more time each milking depending on the parlor design and milking routine organization. However, the consistently proven benefits of teat dipping in the reduction of intramammary infection could be realized.

What about the use of ointments, salves and other such “teat conditioners”? Very little research data is available testing the use of such products. Even though some of these products have had disinfectants incorporated, their disinfectant efficacy is of doubtful value since it is known that high concentrations of emollients tend to reduce the effectiveness of disinfectants. In addition, application of such products will take equal or more time than the teat dipping and blotting dry procedure. Ointments and salves do, however, have a beneficial use in the rehabilitation of injured teats and they will restore teat condition due to chapping.

Field reports indicate that teat irritation occurred in a few herds where teat ointments and salves were used post-milking along with the practice of predipping as a pre-milking sanitation method. Apparently the teat irritation resulted from the chemical interaction of the residual salve and the predip solution.

Cold Weather Teat Dips

Some recent innovations may be useful. For example, some field studies have been conducted using a dry dip. This product is a powdered disinfectant which when applied immediately after milking, sticks to the moist teat. In theory, this idea has great appeal in solving the problem of teat dipping during sub-zero temperatures in cold free-stall dairies not only because of its disinfectant characteristics, but also because it serves to dry the teat. In practice, the product is difficult to apply and the aerosoled dust may be irritating when inhaled by milkers. There are also a few liquid teat dips formulated to reduce the chances of frostbite during cold weather. However, it should be kept in mind that these teat dips, under extreme cold, will also freeze. Therefore, the safest course of action when using liquid teat dips in extreme cold is to dip the teat, allow 30-second contact time, and then blot the teat dry before returning the cow to the cold housing area.

Summary

Be aware of the challenges in teat dip management during below-freezing weather. Always mix thoroughly teat dip in storage containers before refilling the teat dip cup. Provide protection from winds around parlor exits and feed bunks located outside buildings. When severe cold exposure conditions exist, continue to teat dip cows, but be sure teats are dry before cows leave the parlor. Take special precautions to protect debilitated cows or those with udder edema from severe cold.

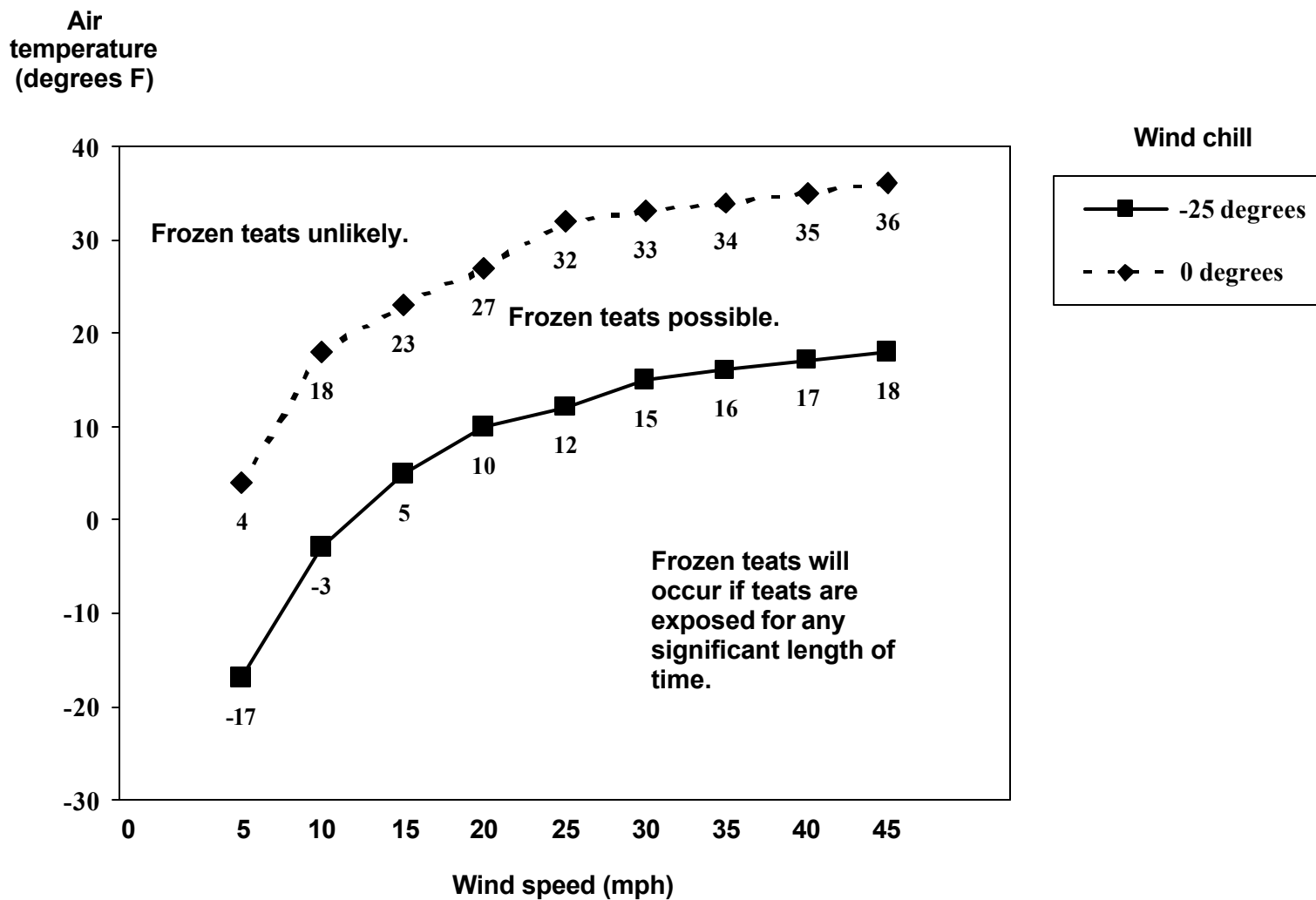


Figure 1. Wind chill effect on exposed skin.

Table 1. Wind chill equivalent temperature (°F).

Wind speed (mph)	Air temperature (°F)																			
	45	40	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45	
5	43	37	32	27	22	16	11	6	1	-5	-10	-15	-20	-26	-31	-36	-41	-47	-52	
10	34	28	22	16	10	4	-3	-9	-15	-21	-27	-33	-40	-46	-52	-58	-64	-70	-76	
15	29	22	16	9	2	-5	-11	-18	-25	-32	-38	-45	-52	-58	-65	-72	-79	-85	-92	
20	25	18	11	4	-3	-10	-17	-25	-32	-39	-46	-53	-60	-67	-74	-82	-89	-96	-103	
25	23	15	8	0	-7	-15	-22	-29	-37	-44	-52	-59	-66	-74	-81	-89	-96	-104	-111	
30	21	13	5	-2	-10	-18	-25	-33	-41	-48	-56	-63	-71	-79	-86	-94	-102	-109	-117	
35	19	11	3	-4	-12	-20	-28	-35	-43	-51	-59	-67	-74	-82	-90	-98	-106	-113	-121	
40	18	10	2	-6	-14	-22	-29	-37	-45	-53	-61	-69	-77	-85	-93	-101	-108	-116	-124	
45	17	9	1	-7	-15	-23	-31	-39	-47	-55	-62	-70	-78	-86	-94	-102	-110	-118	-126	

No risk
Danger, some risk
Severe danger, eminent risk

