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PROPHYLAXIS OF BLOAT

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The present invention relates to bloat and more especially to compositions and methods having particular utility in the prophylaxis of frothy bloat.

Bloat is the building up of gas pressure in the paunch of ruminants such as the cow, sheep and the like. A swelling in the left flank is usually the first obvious sign. The animal's eyes bulge, the animal becomes uneasy, it stops eating, and it may become frantic in its efforts to lessen the pressure of gas in its paunch. It can be fatal and has been recognized as a serious problem for many years. Veterinarians, for example, treated an estimated 13,000 cases of cattle bloat in Wisconsin in 1951, and yearly losses from bloat in this state alone run well over two million dollars. See University of Wisconsin, Extension Service, Circular 446, April 1953.

Various suggestions of possible causes of bloat as well as so-called "cures" have been made by previous investigators in this field. However, prior to the discoveries leading to the present invention no medicinal preparation has been experimentally proven to have value in preventing or curing bloat. As a result, when an animal was very badly bloated and showed no sign of recovering without help, the treatment indicated called for the insertion of a sharp instrument, preferably a trocar or canula, deep into the most swollen part of the left flank to let the gas escape. The disadvantages of this drastic treatment are apparent.

Recently the use of so-called surface-tension increasing agents such as the methyl silicones have been proposed for the treatment of bloat. U.S. Patent No. 2,635,981. These agents are known as foam depressants and, while this approach may be preferred to the "sticking" operation described above, it still fails to solve the problem as it deals with treatment rather than the all-important prevention of bloat.

During the research investigations relating to bloat it was determined that acute bloat is more prevalent in animals consuming legumes e.g., alfalfa, and particularly so when the legumes are pastured and are young and not stemmy. It was also determined that bloat is associated with rainy spells, wet seasons and the like. It was further determined that heavy feeding of grains to "finish" animals may result in bloat. With these and other observations it was then determined that bloat may be caused by food e.g., legumes and grain, sinking to the bottom of the rumen resulting in the liquid level being raised above the opening to the rumen. Large amounts of gas bubbles in the paunch liquor might be responsible for this as well as contributing materially per se to the raising of the liquid above the opening to the rumen. Obviously, when the liquid blocks the food intake tube, elimination of gas by belching is impossible.

In attempts to find means for avoiding this phenomena it was discovered that certain surface-tension reducing detergents would prevent bloat if fed to the animals daily during the period that they are consuming relatively large amounts of legumes, grains and like foods which tend to cause bloat. One group of preferred detergents are the well known anionic alkyl aryl and aryl sulfonates such as available under the trademarks "Nacconol" and "Ultrawet."

It was unexpected that the surface-tension reducing agents would work satisfactorily as they are known foam

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producing agents as distinguished from the silicones which are known as foam depressants. In other words, unlike prior suggestions calling for the use of defoaming agents in the treatment of frothy bloat, the present invention employs foam producing agents as means for eliminating gas and preventing frothy bloat. Based on investigations, it appears that the surface-tension reducing detergents remove gas bubbles in the paunch liquor and thus prevent relatively large amounts of food from sinking to or remaining on the bottom of the rumen. The net result is that the liquid level is maintained below the food intake tube, and gas collecting in the rumen may be readily eliminated by belching.

The detergents suitable for use in the present invention should be substantially non-toxic in the amounts used and should be soluble in the paunch liquor. Detergents which are characterized by antiseptic or bacteriostatic properties such as the cationic detergents are not suitable as they interfere with the essential digestive processes in the animal i.e. deleteriously effect bacteria and enzymes resulting in delay in cellulose digestion. The following are examples illustrating the present invention.

Example I

About 98.5 pounds of ruminant feed made up of a mixture of grains is thoroughly mixed with about 1.5 pounds of powdered dodecyl benzene sodium sulfonate or like higher alkyl aryl alkali metal sulfonate or mixtures of the same.

Example II

About 80 pounds of salt of the grade fed to cattle is thoroughly mixed with about 20 pounds of alkyl aryl sulfonate or aryl sodium sulfonate such as available under the trademark Ultrawet. The resulting mixture is then compressed into a salt cake.

Example III

About 98 pounds of cattle grain based feed is thoroughly mixed with about one pound of alkyl aryl sulfonate of the type available under the trademark Nacconol and about one pound of commercial grade lecithin. Lecithin and like materials can be used alone although their use in combination with an anionic or nonionic detergent and particularly the higher alkyl (10-20 carbon atoms) aromatic sulfonates is preferred. In a similar manner (see Example II), the mixture of detergent e.g. alkyl aryl sulfonate, and lecithin can be mixed with salt and formed into a salt cake.

The detergents, in addition to being mixed with grain or like feed, can also be sprayed in aqueous solution form on food such as hay and the like. Ordinarily the grain based food contains about 0.005-5.0% by weight of the detergent. The detergents can also be mixed with food ingredients such as salt (NaCl) and the mixture used as such or formed into the well known salt cake as noted above. With salt the detergent is ordinarily present in from about 5-25% by weight with a mixture containing about 1 part of detergent and about 4 parts of salt being one of the preferred. Any of the foods suitable for feeding to ruminants can be employed. The amount of detergent combined with the food can vary over wide limits depending upon the amount of food fed to the animals. The amount of detergent required to prevent bloat also varies with the amount of bloat producing foods available to the animal. Optimum amounts as, for example, 1-30 grams per day can be readily ascertained by experiment. In investigations carried out on over 1400 cattle, a daily intake of about 5 to 10 grams of detergent has proven in most instances satisfactory. The compositions of Examples I and III can

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be used as feed concentrates for mixing with grain or they can be used as such in proper amounts to provide the dosages indicated above. A preferred range for concentrates is feed (grain based) containing about 0.5–5.0 percent by weight of detergent.

A surface active agent such as lecithin can be used to advantage as indicated above in combination with a detergent of the type specified. The surface active detergent, on the one hand, has been found to give a very rapid response while lecithin, on the other hand, has been found to be characterized by slow response but with an activity that persists for a relatively long period of time. Maximum effect of the type desired is obtained by use of mixtures as specified in Example III. Lecithin, however, can be advantageously used with salt, e.g. 5–20 pounds of lecithin to 95–80 pounds of salt in cake or loose form, without detergent, and the resulting salt composition used with or without grain based feed containing surface active detergent.

Any of the anionic and nonionic detergents can be employed in the present invention. Masking or flavoring agents such as licorice can also be employed to mask the taste of the detergent or surface active agent and make the compositions more acceptable to the ruminant. One of the preferred compositions in this connection is made up of about 15% molasses, 35–39% corn meal, 30% salt, 15–16% lecithin with or without about 5%

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alkyl aryl sulfonate. Minerals or other nutrients can also be incorporated in this and other compositions of the present invention.

I claim:

5 1. A composition adaptable for use in the prophylaxis of bloat comprising a ruminant food containing as essential ingredients lecithin in combination with a surface-tension reducing agent selected from the class consisting of anionic and nonionic detergents which are sol-
10 ule in paunch liquor.

2. A composition adaptable for use in the prophylaxis of bloat comprising essentially about 15% molasses, 35–39% corn meal, 30% salt, 15–16% lecithin and about
15 5% alkyl aryl sulfonate which is soluble in paunch liquor.

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