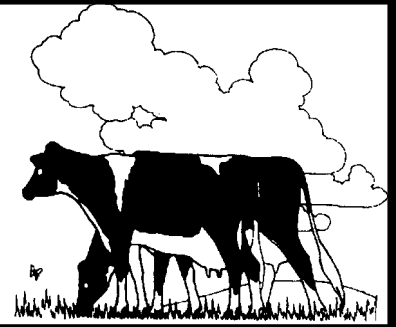


UW-EXTENSION COWSCOPE



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A MANAGEMENT APPROACH FOR THE CONTROL OF MASTITIS INFECTIONS IN DAIRY CATTLE - PART 3

**Ken Bolton, Dairy & Livestock Agent
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Shelf #2- Response:

Clinical Mastitis Plan:

Shelf-two of the mastitis tool box also contains two subparts; the Clinical Plan and the Sub-Clinical Plan (Dr. David Rhoda, personal communication). The Clinical Plan includes the decision to treat or not to treat. This decision will be made based on the culture and clinical mastitis history of the herd, when developed. In the absence or at the direction of recorded mastitis history, many producers improve treatment effectiveness by treating early and for extended periods of time, typically for at least two milkings beyond the appearance of normal milk. The information needed to make informed treatment decisions is gathered beginning with a determination of how clinical mastitis is diagnosed. Less attentive dairy managers may not recognize clinical mastitis in its earliest forms until garget is found in the equipment, on the filter sock or strainer pad. More astute cow men will recognize more subtle changes in cow behavior including being off feed, listlessness, sunken eyes, a swollen quarter and an increased rectal temperature.

The earliest detection of first stage clinical mastitis is accomplished during udder prep fore-stripping by visibly evaluating milk for abnormalities. In the milking parlor this is typically accomplished by fore-stripping each teat onto the parlor floor. In stall barns or other housing arrangements where the cow is likely to lie down where she is milked, stripping into a strip-cup retains this highest of all SCC milk from the udder which can then be disposed of in a sanitary manner. Use of a strip-cup is also recommended for better visibility, to teach milk evaluation skills and

even in the parlor when contagious mastitis is present in the herd.

Adding a severity score to the clinical diagnosis and udder health record provides additional information from which informed treatment decisions can be made (Dr. David Rhoda, personal communication). We suggest that clinical mastitis milk be scored on a three point scale; *Mild*, *Moderate* or *Severe*. Normal appearing milk with flakes and/or garget represents a *Mild* score. Milk that is slightly off color to watery, along with any of the following, flakes or garget along with a swollen quarter earns a *Moderate* score. *Severe* clinical mastitis milk is any or all of the previous conditions along with systemic involvement; a sick cow including off-feed, listlessness and or an elevated rectal temperature.

Once a severity score is assigned to the clinical case, a treatment decision protocol can be developed based on severity and a herd/cow history developed from SCC, Linear Score (LS) or CMT and milk culture results. An example response protocol for a herd with a history of mastitis caused by Gram - organisms may include the decision not to treat *Mild* cases of mastitis, to treat in the quarter *Moderate* cases and to treat both the quarter and the cow with *Severe* clinical mastitis. Herds with documented Gram+ mastitis may, on the other hand, decide to treat *Mild* clinical mastitis and for an extended period of time. Mild mastitis from chronically infected cows is often monitored but not treated. Be certain to develop treatment protocols with your attending veterinarian as they have intimate knowledge of your herd's mastitis history and are in a professional

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position to both advise and prescribe appropriate pharmaceuticals and therapy. An important part of any treatment protocol includes appropriate milk withholding times from the market. In the case of Gram+ mastitis a decision may also be made as to whether sub-clinical quarters are treated along with clinical quarters.

It is important to record treatment decisions and products used for each cow as well as treatment success or progress made in returning her to normal milk production. You may use the *Udder Health Record* form (Cowscope, January 2008) to do so. Refer to this record as clinical mastitis is detected and decisions are made.

Treatment of clinical mastitis during lactation most often returns clinically affected milk to a sub-clinical status as biological cures are low. The most effective mastitis treatment is at dry off where biological cures may exceed 80%.

Sub-Clinical Mastitis Plan:

Sub-clinical mastitis infections are present even with normal milk and a normal appearing cow but with a positive CMT, SCC greater than 200,000 or LS over 4.0. Records may be developed and monitored according to the process discussed above under *Sanitation- Milking Herd* through the use of SCC, LS and/or CMT udder health information along with bacteria culture results. Some milking equipment also provides the manager with electrical conductivity information.

In the case of positive CMT quarter results, use the *Udder Health Record* form to log information for each cow tested, each infected quarter, when they were first detected and the duration of the infection. Decisions may then be made from this information to divert infected quarters from the consumable milk supply, culture for bacteria identification, direct treatment choice, to not breed the cow back and cull or to make other management changes.

Positive CMT, SCC > 200,000 or LS > 4.0 history information may be effectively utilized in monitoring the infection status of individual cows as discussed earlier. It is helpful in developing cow and herd histories to identify with the CMT and record the sub-clinical quarter(s) on each cow so they may be sampled for culturing. In herds with Strep ag mastitis, composite samples of milk from all four quarters will yield good results and saves the cost of culturing

individual quarter samples. However, in the case of Staph aureus and Mycoplasma mastitis, individual quarter samples are preferred due to the low number of bacteria shed, intermittent shedding of bacteria and the difficulty of getting the bacteria to grow under laboratory conditions. A special medium and culture protocol must be used for Mycoplasma.

Herd histories are also enhanced with monthly bulk tank culture information. Bulk tank culturing, while not as sensitive as individual quarter or udder composite samples, is an economical and effective approach to monitoring the organisms infecting the herd and to monitor milking sanitation as discussed under *Sanitation- Milking Procedure*. Use caution in a diagnosis based on a bulk tank culture result. Bacteria cultured from bulk tank milk are from a wide range of sources, one of which is the udder. Other sources of contamination may include the milking and storage equipment, the cow's teat skin, contamination from the environment during the milking process, from other parts of the cow and from dropped milking units onto the floor or ground.

Summary:

Bovine mastitis is a complicated malady for many dairy herd managers and those who advise them. Compounding the confusion is that the causative agent is microscopic bacteria which are invisible to the human eye. The diagnosis of mastitis is then left up to the manager's ability as a cow linguist. The ability to understand the diversity of signs and indications the cow provides us in her attempt to communicate that she is sick both sub-clinically and clinically. Fortunately, we have tools to assist in this diagnosis including the strip-cup, CMT paddle, DHIA and milk plant udder health measures including SCC and LS as well as laboratory bacteria culturing.

Responding only to clinical mastitis results in great financial loss to the dairy producer as well as a low quality food product offered to the consumer. Therefore, prevention of mastitis is the preferred management approach with an appropriate response when mastitis is diagnosed. In the case of sub-clinical mastitis, the appropriate response is likely management changes to prevent its spread to uninfected udders and to limit the risk of future new infections. In the case of clinical mastitis, the appropriate response is typically antibiotic and other approved therapies in an attempt to return the infection to sub-clinical status if not the low likelihood

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of a bacteriological cure. Most mastitis cures occur during the dry period.

I have shared with you the concept of the *Milk Quality Tool Box* that Dr. Rhoda and I hope will clarify many of the mysteries surrounding mastitis concepts including prevention and response

options. It is my sincere hope that you will be able to use these thoughts as well as the wealth of information available from other sources to enhance your knowledge, understanding, quality of milk produced and profit.

References are available on request.

WHAT DOES IT COST TO RAISE THAT HEIFER

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As dairy production costs have escalated, so to have the cost of producing replacement heifers. The cost of raising dairy calves and replacement heifers is very significant on Wisconsin dairy farms. Calculating the costs associated with raising dairy calves and heifers is an essential part of dairy business management. To augment individual dairy calf and heifer cost of production analysis, the dairy industry also requires a set of benchmark cost of production data in which individual business costs and labor and management efficiencies can be

compared. The objective of the "Economic Costs and Labor Efficiencies Associated with Raising Dairy Replacements on Wisconsin Dairy Farms" project was to update the previous work completed by UW-Extension in 1997.

The full report is available at <http://www.uwex.edu/ces/cty/jefferson/ag/agdairy.html> or by contacting me at the UW-Extension, Jefferson County Office.



REVISED UDDER HEALTH MANAGEMENT (UHM) REPORTS - PART 2

Ken Bolton, Dairy & Livestock Agent
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Both the level of communications about and the amount of information available for the new Udder Health Management (UHM) Reports has increased since they were introduced on January 1, 2008. As a result, the following is an update of what is understood at this time pertaining to these very important AgSource DHIA reports. Items discussed in last month's Cowscope can now be clarified, corrected and expanded upon although these articles are not intended to be the last word on neither the interpretation nor application of this data. It will take us a bit more time and experience to develop a working knowledge of how to apply the information contained in this revision. We are all learning together!

Your ability to choose\ continue with either the old or new versions has been explained as "At the end of the three month period, one option is to continue on the old report format. Present plans call for an evaluation of use of this report and possible termination at the end of 2008." Additional perspective is provided in the Winter 2008 AgSource Management Outlook newsletter which says "At the

end of the 90 day trial period (January through March) you have the option of receiving the new reports, continue just with the old reports or tell your Field Technician to take you off the option."

In the last article I referenced the new version as the new UHM Reports in a general sense. Because of a name change from Udder Health Management Cow *List* to Udder Health Management Cow *Report*, some confusion may have resulted. This is the main difference in titles between the old and new products.

When making a general comparison between the old and new UHM versions I commented that the new reports deemphasize information needed for making individual cow decisions, placing more emphasis on herd-wide trends. Quoting the Winter 2008 AgSource Management Outlook newsletter "The new UHM Summary and Cow Report function in tandem to describe herd level changes in SCC and provide the opportunities to make individual cow decisions." The Summary has been and still is a herd-based approach to mastitis evaluation and the new Cow Report is oriented to infection status

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groupings along with more limited individual cow history information compared to the original report.

Obtaining a layman's definition for "Risk Group Analysis" is still a work in progress. It seems that Risk Group Analysis and At-Risk Group Analysis are statistical terms used in the medical community and, that the two may represent opposite concepts. A working definition is still needed and is being sought. Contrary to what may be the common understanding of the title, Chart B of the Summary is information pertaining to infected animals in the herd.

Also, little progress has been made in answering the question "Compared to what?" in relation to Summary Graph B where absolute cow counts are provided for Risk Group Analysis. The assumption is that your herd size remains constant relative to the change in new and chronic infections. As long as herd size varies by not much more than the variation in New Infection Rate and, in the same direction, it doesn't change the interpretation of the graph. When this isn't the case, proportional (percentage) versus absolute cow counts are needed to accurately use the information. Reference the number of cows sampled in Block C in relation to the ebb and flow of the graph in Block B to help put this information in perspective.

Last month I misspoke in saying that a change was made in the weighted average SCC calculation so the result correlates more closely with your bulk tank averages. In fact, no change was made in the weighted average calculation. A new calculation has been added called Bulk Tank SCC. The difference between the two represents an improvement in the new reports as the Bulk Tank calculation is a new addition considering all cows sampled on test day, including Condition Affecting Record (CAR) cows. Therefore, this calculation should more closely approximate your bulk tank SCC as reported from the milk plant, unlike the Weighted Average SCC.

I have also learned that the new report New Infection Rate (NI) is not calculated the same as the old. With the old report an infection was only identified as "New" the first time a cow's SCC exceeded 199,999. This approach tended to underestimate a herd's level of new infections. The new report allows a cow to be identified as "New" any time her SCC exceeds 199,999 after dropping below this level for at least one test. The new approach more accurately identifies new infections in herds that have eradicated contagious mastitis organisms

such as *Strep agalactiae*, *Staph aureus* and *Mycoplasma*. It may, however, over estimate the NI rate in herds with, particularly *Staph aureus*, as chronically infected cows often drop to a low SCC for a month or two but are still chronically infected.

As these reports arrive on farms, we learn more about this area specifically as well as other aspects. For example, on a recent contact with a herd, the new Cow Report listed four NI, three of which are chronically infected cows. Be certain to consider the information in the "Curr Lact Test > 200" column for the number of tests exceeding this level. If the number is more than a couple, more information is needed to confirm the cow's status. I recommend you check previous reports as they become available as to whether the same cows have appeared on the new Chronic List and/or the old report Cow Lists for a longer term picture of udder health status.

Although earlier information seemed to indicate that the new report identified a cow as chronic if she registered a SCC of >200,000 twice at any point during the present lactation additional clarification confirms that the old definition is still in force; a cow must have a minimum of *two* consecutive SCC tests above 199,999 (or "High" on each test on either side of a dry period) to be classified as Chronic. Consistent with the discussion in the previous paragraph, chronically infected cows who move to the NI List will likely not appear on the Chronic Cow List. Caution is suggested so decisions are made after considering all information needed relative to treatment, milking order/lot assignments as well as culling. One chronic cow in a herd or lot of uninfected individuals is a more significant economic risk than a single NI in a group of chronics.

Although earlier indications were that Chart F "Response to New Infection List" of the Cow Report would be removed, it is provided on the Cow List. AgSource information indicates that "The objective of this list is to determine what happened to these infections on the current test day. " In addition to the usual information provided for each cow, the "Infection Response" column determines if the cow is <200,000 (current SCC is <200,000), DETERIORATED (current SCC is > previous SCC) or IMPROVED (current SCC is less than the previous test day's SCC, but not <200,000).

Of the various issues raised relative to the new UHM reports, none rise to the level of concern as that of "Block F". The designations "Deteriorated" and

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“Improved”, based upon minimal positive or negative changes in SCC relative to infection status is not supported by peer reviewed research. Changes in SCC can be due to the cow’s response to invading bacteria. In other words, she is mobilizing a greater or lesser number of white blood cells to fight the bugs. It can be due to a change in the rate of dilution of SCC in the milk produced. Somatic cell count is reported in terms of white blood cells per milliliter of milk. A chronically infected cow with a clinical case of mastitis whose milk production is compromised due to the flair-up and then begins to feel better along with producing more milk can produce milk with a lower SCC although the same number of white blood cells is released into the udder. There has been no change in infection status only in the concentration of somatic cells in the milk and thus, level of milk quality.

The data in Block F is provided for individual cows and thus the only interpretation support by scientific evidence is the 200,000 threshold - cows above 200,000 SCC for two months or more are very likely infected and those below 200,000 SCC for a couple of months are likely not infected. Cows, nor any other animal, are capable of being more or less infected. This is a common misconception. I often compare the situation to pregnancy. A cow 28 days pregnant is no less pregnant then one at 280 days into gestation. There are no degrees, they either are or they aren’t.

Now if you ignore the “Infection Response” column (and I recommend that you do) and instead key in on the number of times during the current and previous lactation the cow registers tests greater than 200,000 then judgment calls may begin to be made. For example, if a cow has two consecutive tests above 200,000 and is only 50-60 days in milk with no tests above 200,000 in the previous lactation, she is likely newly infected. But, if she presents similar data and was infected the majority of tests in the previous lactation she is not a new infection but is rather, chronically infected. The only judgment call that can be made from the “Infection Response” column is whether milk quality, SCC level, is increasing or declining not whether the infection has changed. So, unless you’re in dire need of a false sense of security to make it through the day, please ignore the “Infection Response” column.

I ask you to think through what you will do with the information from this and all other animal records. What actions will you take? Will you base treatment, lot or milking order assignments or culling decisions based on information from a single month’s report? Will you dig deeper for a complete picture of what the cow is communicating? Are you implementing actions based on written protocol? Each infection block of the Cow Lists provides good information to support informed decision making beyond the title and the cow ID. Be sure to review the detail along with historic records before finalizing major decisions.

Did you know:

- Every day more money is printed for Monopoly than the US Treasury.
- Men can read smaller print than women can; women can hear better.
- Coca-Cola was originally green.
- It is impossible to lick your elbow. Try it!
- The state where more people walk to work: Alaska.
- The percentage of Africa that is wilderness: 28% (now get this)
- The percentage of North American that is wilderness: 38%
- The cost of raising a medium-size dog to the age of eleven: \$6,400
- The average number of people airborne over the US anytime: 61,000
- Intelligent people have more zinc and copper in their hair.
- The first novel ever written on a typewriter: Tom Sawyer.
- San Francisco Cable cars are the only mobile National Monuments.
- All kings in a deck of playing cards represent a great king from history: Spades - King David, Hearts - Charlemagne, Clubs - Alexander, the Great Diamonds - Julius Caesar

BOVINE SOMATOTROPIN (BST) SAFETY AROUND THE WORLD

Terry D. Etherton, Pennsylvania State University

A common “sound bite” in the arsenal of individuals who oppose rbST use in the dairy industry in the United States is that it is banned in most countries around the world, especially Canada and all the European nations to protect the milk supply. This is inaccurate and misleading. **Here are the facts:**

The Facts:

No country has a regulatory ban on rbST. Registration of rbST for commercial sale simply has not been completed in many countries.

No country has banned the importation of milk or milk products from the U.S. produced from cows supplemented with rbST (statement by U.S. Dairy Export Council).

There are 20 countries that have a current registration of rbST for commercial sale. Chile is the most recent country to grant registration which was achieved in 2006.

There are 56 countries which have confirmed that rbST use is safe and does not threaten the human food chain, including Canada, and most of the European Union. Confirmation of human safety is the first step in a registration process.

All countries have regulatory agencies similar to the FDA in the United States that must approve pharmaceuticals for commercial sale within those countries.

While there are countries in which rbST has not received registration for commercial sale, the registration process is still open; however in some countries the process has been suspended or blocked, sometimes through a legislative ban, for political or economic reasons.

Economic impact is not usually a reason that can be cited in most countries for denying the grant of a pharmacological registration. Only efficacy, human safety, and animal safety are the key determinants. Typically, the ploy “**questions that need further investigation regarding animal safety**” is used to delay or suspend the registration process when there are economic or political considerations.

The economic consideration for countries like Canada and many European nations is their current domestic milk marketing system is based on a quota

system which discourages increases in milk production in order to protect the marketplace for producers (see Sidebar section below).

Sidebar:

Numerous United States and international medical, scientific, and regulatory agencies have issued statements supporting and confirming the safety of rbST and that there is no threat to human health by rbST use (the list of agencies is presented below).

Quota Overview:

The primary purpose of a quota marketing system is to keep milk prices artificially high through supply limitation. Quota systems limit competition and therefore reduce the number of producers that exit an industry.

A producer has to own quota for every pound of milk produced in order to market all of their milk under the profitable market prices. Milk not covered by quota can only be marketed at severely discounted prices, making profit impossible for non-quota milk.

Quota is prohibitively expensive to obtain in order to discourage production increases thus discouraging the adoption of technology, farm expansion, and practices that improve production efficiency.

Furthermore quota is a capital asset and can be borrowed against in many countries.

A quota system is difficult to abandon once adopted because vested people and financial institutions with liens against quota value would lose net worth. Consequently, they fight to preserve the status quo. This makes it apparent why the availability of a production-enhancement technology with the impact of rbST would be disruptive to domestic marketplace status quo in countries with a quota system.

Scientific/Medical/Health/Governmental Organizations that have confirmed the Human Safety of milk and meat products from cows supplemented with rbST (list is not inclusive)

- American Cancer Society
- American Council on Science & Health
- American Dietetic Association (ADA)
- American Medical Association (AMA)

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- Canadian Animal Health Institute
- Canadian Dietetic Association
- Canadian Institute of Biotechnology
- Canadian Medical Association
- Canadian Network of Toxicology Centres
- Canadian Pediatric Society
- Children's Nutrition Research Center, Baylor College of Medicine
- Council on Agricultural Science & Technology
- European Union's Committee for Veterinary Medicinal Products (CVMP)
- Federal Drug Administration (FDA)
- Food & Agriculture Organization of the United Nations (FAO)
- Food & Nutrition Science Alliance
- Food Marketing Institute
- Grocery Manufacturers of America (GMA)
- Health Canada (Royal College of Physicians & Surgeons)
- Institute of Food Technologists (IFT)
- International Dairy Foods Association (IDFA)
- Joint FAO & WHO (World Health Organization) Expert Committee on Food Additives (JECFA)
- National-American Wholesale Grocers' Association
- National Dairy Council
- National Institutes of Health (NIH)
- The American Academy of Family Physicians Foundation
- Toronto Biotechnology Initiative
- University of California – Berkeley
- University of California – Davis
- U.S. Congress Office of Technology Assessment (OTA)
- U.S. Dairy Export Council
- U.S. Surgeon General's Office

- Terry Etherton's Blog on Biotechnology

Be sure to listen in weekly to your UW-Extension Agricultural Agents on radio station 940, WFAW. Joe Bollman brings you the Crops & Soils update each Wednesday at 6:15 AM with Ken appearing on Fridays at 6:15 AM with the Dairy & Livestock Report.

GLYCERIN AS A POTENTIAL FEED INGREDIENT FOR DAIRY CATTLE

James K. Drackley, University of Illinois

TAKE HOME MESSAGES

- Glycerin, or glycerol, is a byproduct of biodiesel production and contains essentially the same amount of energy as corn grain on a dry matter basis.
- Limited experimental evidence indicates that glycerol can be added at up to 10% of dietary dry matter in replacement for grains without impacting milk production or composition if economically favorable on an energy-equivalent basis.
- Purity of glycerin is variable and must be determined carefully, as contents of water, methanol, phosphorus, and potassium are high in less purified sources.
- Glycerol contributes desirable qualities to pelleted feeds.

INTRODUCTION

Glycerin, also referred to as glycerine, is a product of the processing of fats for the chemical industry and for biodiesel production. Its main component is glycerol, with varying amounts of water and other impurities. Supply of glycerin in the United States and worldwide is projected to grow over the

next decade as government policies and incentives favor increased processing of plant oils for production of biodiesel fuels and as worldwide production of fats and oils continues to increase. Glycerin price may decrease because of this increased supply. Given projections that prices for corn and other cereals likely will continue to increase as ethanol production consumes more of the corn crop, glycerin might become attractive as a feed for dairy cattle.

NUTRITIONAL VALUE OF GLYCERIN

Glycerin is available from the biodiesel or chemical industries in many grades of purity and potential value of available sources must be assessed carefully. German researchers determined that the net energy (NEL) value of glycerol (1.03 to 1.05 megacalories per pound dry matter) in sheep, steers, and dairy cows was equal to or greater than that of corn grain. Net energy values were approximately 13% lower in high-starch diets (about 0.90 megacalories per pound) than in lower-starch diets, which was attributable to decreased cell wall (NDF) digestibility caused by addition of glycerol to

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the higher-starch diets. Therefore, the economic value of energy from glycerin can be compared directly with that of corn grain after correcting for the glycerol content (analogous to the “dry matter” content of the glycerin) of the material. The water content of glycerin used in various scientific studies has ranged from a low of 1% to as much as 26.8%.

The German research showed that up to 10% of the dietary dry matter could be supplied by glycerol with no decreases in feed intake or alterations of performance in growing ruminants or lactating cows. Similarly, feeding experiments with growing chickens showed that 5% addition of glycerol did not affect growth or feed efficiency, but addition of 10% slightly decreased performance. It should be noted that no experiments are available in which glycerol was supplemented to high producing dairy cows during established lactation, so the effects in those cows are uncertain. Feeding glycerol increased water content of rumen digesta in the German studies, and has been reported to stimulate water intake in other species.

South Dakota researchers found that glycerol in diets for transition cows decreased dry matter intake before calving but not after calving. They found few benefits to dietary supplementation of glycerol, in contrast to research that showed increases in blood glucose when glycerol was administered by drench similar to propylene glycol. The difference likely results from the fact that most glycerol consumed in the diet is fermented in the rumen to propionate and butyrate. When larger volumes are administered as a bolus dose, however, some glycerol can be absorbed directly through the rumen epithelium. Glycerol absorbed from the rumen would be converted to glucose by the liver.

Other concerns with glycerin as a feedstuff are the contents of methanol and mineral salts. Methanol is used in biodiesel manufacture and less pure sources of glycerol may contain large amounts of methanol. For example, a low-purity source of glycerin tested by German researchers contained 26.7% methanol on a dry matter basis, and the glycerin used in the South Dakota study contained 1.3% methanol. While methanol may be detoxified in the rumen, methanol consumption from larger amounts of less pure glycerin sources may be excessive. Methanol would be even more detrimental for preruminant calves and other nonruminants.

The South Dakota study reported that glycerin contained 11.5% “salt”, but other sources have reported low sodium contents. The high “salt” content likely is contributed mainly by potassium salts and phosphates, because potassium content in the German research ranged from 2.2 to 2.3% of the dry matter and phosphorus from 1.05 to 2.36%. Contributions to mineral intake by glycerin might be a factor in dry matter intake and need to be accounted for in ration formulation. The high phosphorus content also is a concern in nutrient management plans.

GLYCERIN IN MANUFACTURED FEEDS

Large farms may be able to handle glycerin as a bulk liquid and incorporate it into total mixed rations. However, glycerin may work well in pelleted concentrates as well. An interesting set of evaluations of glycerol addition to pelleted feeds was made by German researchers. Glycerol was added in increasing amounts to a concentrate containing wheat, soybean meal, rapeseed meal, beet pulp, wheat bran, corn, and vitamin-mineral premix. The mixture then was pelleted and stored under different conditions for different amounts of time. As little as 5% glycerol added to the mixture was effective in preserving higher-moisture pellets as indicated by suppression of fungal growth. Other measures of pellet quality and integrity were unchanged or improved by glycerol addition. Pelleting mixtures with less-pure glycerin resulted in little methanol detected in the pellets, probably because the heat generated in the pelleting process caused the methanol to volatilize. Consequently, the prospects for addition of glycerin to pelleted feed mixtures for dairy cattle seem promising. Although additional research is needed to define amounts of glycerin that can be fed to dairy cattle during peak lactation, current evidence indicates that up to 10% glycerin can be added to replace corn grain in diets for dairy cows if economically favorable.

- Illinois Livestock Trails

