ANDDA
American Nigerian Dwarf Dairy Association
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Champion Wins and ROA

Much discussion has swirled online about verifying Champion Challenge status, especially with the new Postal Ballot currently being discussed by ADGA Board of Directors. The information on the ROA helps determine if a champion leg is counted toward permanent championship.

Amy Kowalik, Office Manager of American Goat Society, explained the ROA needs to be complete and accurate. Some ROA's are missing information which would invalidate the win until it is corrected.

Any error on an ROA invalidates every breed win on the document. It is important to verify information prior to signing any award report.

"ROA's are how we verify that the proper rules were followed, sanction requirements met, and animal identification was correct in order to award legs," Kowalik said.

The time stamp on the ROA helps determine when, if any, a Reserve animal may win a leg.

While AGS has been allowing some photos of ADGA ROA's on a case-by-case basis since the ADGA NG rollout, she stresses that all the proper information should be included.

"The problem with using a picture of the ROA is that rarely does anyone actually take a decent picture," Kowalik said. "We get blurry pictures of the 3rd copy and it doesn't have all the information we need." Kowalik said it is important to get a photo of the bottom where the judge has signed the document.

AGS will register ADGA animals with a copy of the ADGA registration papers. They will also count 2 legs of an ADGA finished Champion.

"They must get 1 leg in AGS," Kowalik said. "They can use their Champion award certificate that has the show information or if they have the older subscription report proof, that works too."

The AGS Show Win form can be found here.

INSIDE THIS ISSUE:

ANDDA NEW BREEDERS—Finding a Vet

One of the most important parts of owning dairy goats—or any livestock—is finding a knowledgeable vet. Usually that is not one of the first things a new owner takes into consideration before purchasing an animal.

- So, how do you find a vet? There are a few questions you should ask yourself:
- Do I want a vet who focuses on holistic treatments versus just traditional medicine?
- Am I concerned about location, fees, and payment options?
- Are they a general livestock vet or do they have dairy goat experience?
- Will they take after-hours emergency calls?

Once you understand what your goals are, start your search here:

- **Ask a friend or mentor.** Ask what they like about their vet, their office, and their staff. Also ask if they've encountered any problems.
- **Talk to a local breed club.**
- **Consider convenience.**
- **Think about what matters to you.** Do you want your animal to see the same vet at each visit?. IIs same-day appointments important? Will they offer telephone consultations?

The importance of establishing a vet client-patient relationship

The American Veterinary Medical Association has established guidelines for vets and their patients called the veterinary-client-patient-relationship (VCPR). When a vet examines, diagnoses, treats, and follows up with an animal, they establish a VCPR relationship.

A VCPR relationship is important because it allows your vet to get to know your management practices and your animals. It also allows your vet to diagnose and treat your animal.

One of the first things a new owner should do is take their animal to a vet for a wellness check and establish a relationship.

How do I find an emergency vet?

Ask your vet how they handle emergency situations. Some vets may rotate with other vets in their practice to offer emergency care after hours. Other veterinarians partner with local emergency clinics, animal hospitals, or veterinary schools.

Make sure you ask your vet what you should do if something serious happens to your pet that requires urgent care.

Finding a reliable vet that can treat your animals before an emergency arises is one of the first tasks a new owner should undertake.

How to Spot Scam Vendor Events

By Shelley Cleveland, Artofthespirit1@ gmail.com

As you begin to fill your calendar with events, you will more than likely come across Scam vendor shows. These are fake events created to make people think they are legitimate and then begin collecting fees. If you are not careful, you can fall victim to these scammers. While it is hard to catch every scam, I will share 10 red flags that I have experienced over the years. One flag alone does not necessarily mean an event is fake. However, when you get a combination of red flags, it cam help you to weed out the scammers. Most of the scam events happen on Social Media platforms such as Facebook so I will focus on how to avoid falling prey on these platforms.

1. **The Scammer only joined the group that day.** Many times, you can learn a lot just looking at a personal profile. In the case of scammers, most will only have joined the group that day. They join using a fake or stolen image, and will create an event page using phony information. They scam, collect from a few unsuspecting vendors, and just as quickly, they shut down the event and the page. The vendor will have no way to contact the scammer and, with the site shut down, can not even warn others, leaving the scammer to go to another vendor site and start all over again. A brand new account is always a red flag warning. By the time you have become a show coordinator, you will have been on these sites for a long time.

2. **Click on a Coordinators personal profile.** When anyone comments or creates a post on a site, you are able to click to see their personal profile. A scammer will not take the time to create a legitimate profile which could lead to their real identity appears to be brand new, this is a warning to check more before paying anyone.

3. **The scammer will only message information, not share publicly**. Let's say I find an event and want to know if I will be the only soap vendor allowed or if they will have multiple. A scam answer is always, "I will message you." There is a reason for this behavior. If they share information on the public forum and someone figures out their racket, they are done. They would rather private message so, if someone catches on to the scam, they have limited it to one person and not everyone following the thread. Any coordinator who is not willing to answer basic questions on an open forum, especially questions many may also want answers to, is an automatic red flag.

4. **A scammer will always say there is still space available**. As soap vendors, you will find you have a lot of competition joining a show. If a show only allows one or two similar vendors, your spots fill up fast. Always question a post that is a few days old and still has a coordinator telling you they need a soap vendor. The scammer will have you private message where they will tell you, if you hurry, you can fill the soap spot. You panic and quickly send the money so you don't miss out on the opening. They also

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prey by saying they only have "3 spots left" creating the same sense of urgency to pay quickly. Now, every show saying there is still space is not a scam, but know most shows with popular spots for soap, generally fill up within hours, not days. Red flag warning alone? Maybe not. But, combined with others, this is one to watch.

5. **Check with the Venue.** This is my personal favorite and my go-to solution. Scammers will search for venue names in a certain city and then add that name as the space for their "event". A quick call to the posted venue will allow you to verify if an event has been secured with a payment or is actually on their schedule. I will usually shut down an event a day simply by calling to see if they are legitimately on the books.

6. **A Scammer will want you to pay over "friends and family".** You have no recourse to recover money if you pay someone over Friends and Family. This method means you are acting secure and do not need verification of the person you are paying. If I am paying my mom, I do not need a code to know who she is. If I am paying a stranger the same way, the payment method assumes you know the person you are paying and will not refund if this is a scam. They do not want you to have a way to back out of a deal or contact your bank to stop a payment. Do not pay for any event over "Friends and Family".

7. **Scammers will often take legitimate events and ask a cheaper amount.** I have a local show which charges $750 a show. I saw a scam for the same event charging $50 per show. They know people will question a large chunk of change but will not question a smaller amount. The Scammer would rather get several small amounts of money quickly than try for big bucks. Again, every event that has a low fee will not be a scam. They may also say the fee includes your tables and chairs. This is rare, especially if it is an outdoor event. Just watch all the signs and count the flags.

8. **Watch for spelling and grammatical errors**. Many scams will originate in another country and will not be a native English speaker. Not all spelling errors mean a scam but, repeated errors will often set off alarms.

9. **Consider the source.** Ask yourself these questions. "How did I find out about this show?" "Has a friend recommended this show?" "Do I know anyone who has done this event?" "Did this come from a legitimate event site or did I find it on Facebook, Instagram, Snapchat, etc?" If you feel you can trace the source, go for it!

10. **If it sounds too good to be true... You know the old adage**. Trust your gut. If you question why so much is being offered for so little, there is a reason for your discomfort.

I am sure there are many other red flags I have not mentioned. The basics will be up to you to do your own due diligence to protect your business. The scams are getting more sophisticated so it is up to us to make sure to go through these checks to balance out our own protection. Talk to others, ask questions, and don't stop until you feel comfortable. And, most importantly, do not send money until you are secure you have done all you can to join real and legitimate shows. They are out there! Now, go find them!

Mastitis

Mastitis—a word we hear, but what is it? Mastitis is an inflammation of the mammary gland that often presents before, during, or after lactation. Mastitis can be sub-clinical or noticeably inflamed, swollen and hard.

Dr. Jeff Broadaway, Union County Public Health County Veterinarian said it can be caused by multiple different strains of bacteria, including Streptococcus sp, Staphylococcus sp, Pasturella sp, Coliforms (like E. Coli), as well as physical injury and stress. While it can be successfully treated depending on the strain of bacteria, it can also cause a decrease in milk production or scar tissue in the mammary gland. In severe cases, a doe can loose function on half or all of her udder, or may require removal of mammary tissue.

When weaning, if a kid is taken from the dam and she is allowed to dry up naturally without being milked, the udder can become inflamed. Going into the dry period, this bacteria stays in the udder and presents the next time the doe is fresh.

Prevention includes a clean bedding area, hygiene protocols during milking, and adequate nutrition and space. Nutritionists have found that diets deficient in Vitamin A, E, or trace minerals selenium and copper can lead to increased incidence of mastitis.

Horn flies can transmit mastitis bacteria when they land on the end of teats, according to Dr. Broadaway. The teat canal does not seal immediately and flies can be an environmental vector. A teat dip helps seal the cistern and prohibit bacteria from entering the teat canal.

Using a milk machine can potentially transmit the disease, particularly in sub-clinical cases. It is important to milk out those suspected of mastitis at the end of milking to avoid infecting other does on the milk string.

Testing on-farm involves the California Mastitis Test Kit. The California test involves putting a milk sample and reagent in a paddle, then swirling together to see if it reacts by clumping.

Before attempting any treatment, take a sample in a sterile container. Different strains of bacteria react to different antibiotics. If a treatment is administered and does not work, the original sample can allow a lab to pinpoint exactly what antibiotics will combat the strain.

Treatments include intramammary infusions like Today, Tomorrow (for dry does) Spectramast and Masti-Clear. Milk out the doe completely, clean the end of the teat with alcohol or antiseptic, infuse the product, and then massage it into the udder half. Dr Broadaway recommends doing this treatment twice a day for 3 days to his clients. This treatment is contained in the mammary system, but some cases may need a systemic antibiotic as well. Your veterinarian may prescribe an anti-inflammatory and pain reliever like banamine, which works well with soft tissue inflammation.

Involving your vet will allow you to establish a veterinary client relationship. Let your vet know of any treatment and duration. Track any withdrawal times on any treatment used.

Deconstructed Milk Soap

By Dawn Robnett, Mesquite Valley Farm

I got the idea of formulating this soap because first, I'm not a fan of the frozen milk and lye process. Secondly, I had goat cream in the fridge that was beginning to clabber and I was looking for something to do with it. That prompted me to do a little research and the deconstructed milk soap was born.

I made butter out of that clabbering cream and used that as a solid fat and melted it with the base oils. I then added skim milk to the emulsified lye and oils because sugars add bubbly lather. The soap turned out better than I could have hoped for!

No palm oil included in this recipe and all of the fats can be purchased at most grocery stores. I've found that this formula moves to trace a bit quicker than my other formulas so be warned, it may not be a fancy swirl kind of soap but if you like lots of rich creamy lather, it won't matter. I hope you enjoy this soap as much as we do!

OILS		**LYE & WATER**	
Coconut Oil	130 grams	NaOH (3% lye discount)	73 grams
Goat Butter	60 grams	Water	123 grams
Lard	60 grams	Skim Goat Milk	34 grams
Avocado Oil	150 grams		
Olive Oil	100 grams		
Total Weight	500 grams		

OPTIONAL ADDITIVES

Fragrance	22 grams
Colloidal Oatmeal	2 teaspoons
Citric Acid	10 grams

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Measure your water and add the citric acid. Stir until dissolved. If you live in an area that does not have hard water, then you can omit this ingredient. The citric acid serves as a chelator and keeps the minerals in water from affecting the lather in the finished bar. Once the citric acid has dissolved, add your lye, stir well until dissolved. Set aside to cool. Melt and combine fats. Note, the butter adds a few solids to the oils. I did not strain those out and it did not affect my final quality. If using, combine colloidal oatmeal and 1 tablespoon or so of melted oils in a separate bowl. Mix until incorporated then add mixture to oils and combine well. Doing the premix keeps the oats from clumping. Colloidal oats adds to the creamy lather. Add fragrance to oils, mix well. When oils and lye mixture are cooled (80°-90°F), add lye mixture to the oils. Use a few short bursts from the stick blender, then pause to stir. When soap mix begins to emulsify, stir in the skim milk. This is the point where the soap mix will begin to accelerate and heat up so work quickly to combine the skim milk to the soap mixture. When light trace is achieved, pour into mold.

Approx. Volume: 26 fl oz.

Technical notes. For those that like to formulate their own soap, butterfat SAP values may need to be added to your soap calculator.

Here is the data to use:

SAP: 0.162

Specific Gravity: .95

Myristic Acid: 12%

Palmitic Acid: 31%

Stearic acid 11%

Oleic acid 24%

linoleic acid 3%

Linolenic acid 1%

Citric Acid in soap. Citric acid should be calculated at 1-2% of the base oil weight. The citric acid will consume a little bit of the alkali which will result in a superfat. There are two ways of dealing with this. Either keep your superfatting low or add additional NaOH to your formula at the following rate: 10g citric acid neutralizes 6g of NaOH. For this formula, I superfatted at 3% knowing it will be higher once the citric acid and alkali mix. If you'd like more details about using citric acid in soap, go here.

Vaccination as Tool to Prevent Mastitis in Dairy Cows

University of Georgia Extension, Steve Nickerson and Valerie Ryman, Reprint

Mastitis is an economically important disease of dairy cows because it reduces the quantity as well as the quality of milk produced, and as a consequence, lowers producer profits. Control of this disease is based on the following recommended milking procedures: pre- and post-milking teat sanitization, the use of single-service paper or cloth towels to dry udders, and proper milking machine use; prompt antibiotic treatment of clinical cases; dry cow therapy; proper nutrition; and maintaining a clean and dry environment. In addition, vaccination against this disease has been recommended to prevent new infections, thereby eliminating the use of antibiotics in food animals.

The purpose of vaccinating against mastitis-causing bacteria is to stimulate the cow's immune system to protect it against subsequent infection or disease. For example, vaccination may increase circulating antibodies in the blood stream against certain mastitis pathogens to prevent or limit bacterial growth after invasion into a mammary quarter. The resulting enhanced immunity may also minimize pathogen damage to milk-producing tissues, modify the inflammatory response, promote tissue repair, and reduce the clinical expression of disease. A list of bacteria isolated from clinical cases of mastitis is shown in Figure 1. Most cases are caused by coliforms such as *Escherichia coli* (21%), *Klebsiella* (7%), and *Enterobacter* (3%) as a group, followed by the environmental streps (11%), coagulase-negative staphylococci (or CNS, 3%), and *Staphylococcus aureus* (3%), which are isolated less frequently.

Progress has been made in efforts to develop vaccines for preventing both contagious and environmental mastitis. There are commercial mastitis vaccines currently available for *E. coli, S. aureus,* and *Mycoplasma bovis,* and several experimental vaccines based on these three pathogens have been the focus of the pharmaceutical industry and academic institutions for many years. Far less information is available on streptococcal vaccines, and there are currently none commercially available. According the latest National Animal Health Monitoring System survey in 2014, 18.7% of U.S. dairy operations used some type of mastitis vaccine to control this disease, and use increased as herd size increased (Table 1).

The most success in vaccinating cows against mastitis has been realized with gram-negative common core vaccines, which means that the vaccine is meant to target a common portion of many gram-negative pathogens. Bacterins (killed or attenuated bacterial preparations) formulated against coliforms (e.g., *Escherichia, Klebsiella,* and *Enterobacter*) have been developed because the proportion of mastitis caused by environmental bacteria, i.e., coliforms, has increased in many herds. This may be due to: (1) the trend for low somatic cell count (SCC) milk; (2) an increase in cow susceptibility to coliform mastitis; and (3) higher density housing, which increases exposure to environmental pathogens. In addition, common herd health practices such as teat dipping and antibiotic therapy are not effective in controlling coliform mastitis, primarily because of the continuous exposure to these pathogens within the cow's environment. Coliform mastitis may range in severity from subclinical infections to peracute clinical cases. A high proportion of clinical cases occurs within the first three months of lactation, mainly during the first two weeks after calving, causing marked

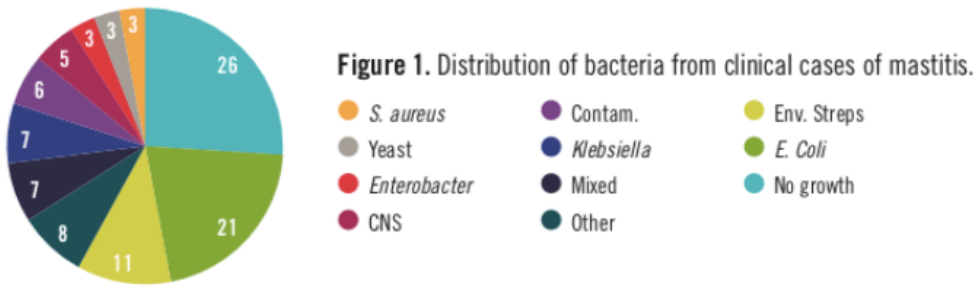

Figure 1. Distribution of bacteria from clinical cases of mastitis.

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losses in milk production, e.g., $100 to $300 per clinical coliform case. Therefore, it is important that the dairy farmer avoid the disease or minimize the risk of infection in the herd.

Table 1. Percentage of dairy operations that use vaccines to control mastitis, by herd size.

	Very small (<30)	Small (30-99)	Medium (100-99)	Large (500+)	All operations
Vaccine	Percentage using vaccination				
E. Coli	2.4	12.4	27.1	50.8	18.1
Staphylococcus aureus	1.5	1.9	0.8	0.3	1.4
Mycoplasma	0.0	0.0	0.0	0.3	0.0
Any	3.9	13.0	27.5	50.9	18.7

How widespread is coliform vaccine use? The National Animal Health Monitoring System estimates that coliform mastitis vaccines were used on approximately 18% of U.S. dairy farms, and use increases as herd size increases (Table 1). For example, coliform vaccines are used in over 50% of large operations milking 500+ cows, whereas only 2.4% of very small farms (<30 cows) use the vaccine. An examination of the percentage of operations that administer mastitis vaccines by U.S. region (Table 2) indicates that *E. coli* vaccines are more popular in the West than the East (35.7% vs. 16.5%), which is most likely associated with greater herd sizes in the West.

Control of coliform mastitis has been made possible through the development of mutant gram-negative bacteria. Vaccines used to combat gram-negative pathogens focus on using the mutant gram-negative core antigen, which lacks the chains that protect the lipopolysaccharides of gram-negative pathogens. This characteristic is important because the antibodies produced by the vaccinated animals are specific to the exposed lipopolysaccharides of all gram-negative organisms whether they are of the genus *Escherichia, Klebsiella,* or *Enterobacter*. Thus, such vaccines stimulate the production of antibodies against common core antigens in the bacterial cell wall that are cross-protective against a wide variety of gram-negative microorganisms. Three such vaccines are described below.

ENVIRACORTM J-5 Vaccine: One of the vaccine products is an *Escherichia coli* J5 mutant bacterin administered subcutaneously at drying off, 30 days later, and again within 14 days of calving (E. coli J5 Strain, Zoetis, Parsippany, New Jersey). Use of this strain of bacteria (*Escherichia coli* J5) in coliform vaccine formulation is unique because it stimulates antibody production against a wide variety of coliform bacteria, including *Klebsiella* and *Enterobacter* species.

Following initial observations that cattle with low naturally-occurring blood antibodies against *E. coli* J5 experienced a fivefold increase in clinical coliform mastitis, researchers in California investigated the efficacy of vaccination in reducing the incidence of clinical coliform mastitis. Vaccinated animals received a total of three subcutaneous injections: 1) the first day of drying off, 2) 28 days after being dried off, and 3) within 14 days of calving. Results showed that during the subsequent 100 days of lactation, the incidence of clinical cases of coliform mastitis was reduced by 80% in animals that were vaccinated.

This same vaccine was subsequently evaluated by researchers in Ohio where vaccinations were given subcutaneously at drying off, 30 days later, and two days after calving. Compared with controls, vaccinated cows exhibited fewer bacteria in milk and lower rectal temperatures following an *E. coli* mastitis challenge at 30 days into lactation. In

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addition, unvaccinated animals experienced greater milk yield and dry matter intake (DMI) depression compared to vaccinated animals. Antibodies in the blood and milk were also higher in vaccinated than control cows. It was concluded that vaccination with the *E. coli* J5 bacterin did not prevent infections but did reduce severity of clinical signs following intramammary challenge with *E. coli*.

This vaccine was then field tested for 2.5 years in a commercial herd under natural exposure conditions and compared with a control group. A total of 67% of gram-negative bacterial infections present at calving in control cows became clinical during the first 90 days of lactation compared with only 20% in vaccinated cows. Thus, the vaccine was over three times more efficacious in reducing clinical mastitis caused by coliform mastitis pathogens compared to unvaccinated animals. New coliform infections, along with severity of clinical mastitis, were also decreased in first lactation heifers.

Table 2. Percentage of operations that administered mastitis vaccines by region.

	Region	
Vaccine	**West**	**East**
E. Coli	35.7	16.5
Staphylococcus aureus	0.3	1.5
Mycoplasma	0.0	0.0
Any	35.9	17.3

A partial budget analysis of on-farm implementation of an *E. coli* J5 vaccination program conducted in 1991 demonstrated that the use of the vaccine on all cows in a herd was profitable when incidence of clinical coliform mastitis exceeded 1%. Using such a program would yield a $57 profit per cow per lactation, and the return on the investment into the vaccine would be approximately 1,700%.

J-VAC® Escherichia coli Bacterin-Toxoid: Another gram-negative vaccine based on the Escherichia coli mutant strain is the J-VAC®, manufactured by Merial Ltd. of Duluth, Georgia. Studies on this bacterin indicate that it is approximately 60% effective in reducing expression of clinical coliform mastitis. In addition, unvaccinated animals experienced increased milk production depression normally encountered with endotoxemia compared to animals vaccinated with J-VAC®. Following label instructions, this vaccine is administered subcutaneously or intramuscularly in the neck at drying off and then cows are boosted two to four weeks later. The injection regimen is followed after each lactation to provide adequate antibody levels during the periparturient period and during early lactation to help provide protection against clinical coliform infections.

ENDOVAC-Dairy® : Another USDA-licensed coliform vaccine is a bacterin-toxoid formulated from a Re-17 mutant of *Salmonella typhimurium* (ENDOVAC-Bovi®; Immvac Inc., Columbia, Missouri) administered during the dry period and cows are boosted two or three weeks later. It works similarly to vaccines formulated with the *E. coli* J5 in stimulating protection against common gram-negative core antigens. In addition, the toxoid component is believed to stimulate immune cells in the cow's body to enhance antibody production to *Salmonella typhimurium* Re-17.

A field trial to test this vaccine in Arizona utilized cows immunized intramuscularly at dry-off and again two to three weeks prepartum and compared them to unvaccinated controls. Data collected over the first five months of lactation showed a 42% reduction in clinical cases of coliform mastitis in vaccinates compared with controls, and a 67% reduction in repeat episodes. In addition, the mortality rate for cows with clinical coliform mastitis was 61% lower in vaccinated cows. Likewise, the culling or removal rate was 61% lower

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in vaccinates compared with controls.

S. aureus *vaccines are used less frequently:* Early efficacy studies on the only commercial *S. aureus* vaccine in the U.S. (Lysigin®, Boehringer Ingelheim Vetmedica, Inc., St. Joseph, Missouri) suggests that it will increase the spontaneous cure rate (no intervention from farm or veterinarian) against *S. aureus* IMI and lower SCC, but does not prevent new IMI in adult cows. Research conducted over the past 15 years has demonstrated that several experimental *S. aureus* vaccines, as well as one commercial vaccine, can reduce the new infection rate in dairy heifers. For example, a *S. aureus* vaccine formulated to stimulate antibodies against two important components of *S. aureus* (pseudocapsule and alpha toxin) was evaluated in heifers in New York. At four and two weeks prior to calving, heifers were given subcutaneous injections into the supramammary lymph node of the mammary gland, and after calving, heifers were challenged with *S. aureus*. Vaccinates demonstrated a 52% reduction in the development of new IMI post-challenge. In addition, 64% of IMI in control cows became chronic compared with only 12% in vaccinates. Subsequently, a field trial in Norway evaluating a S. aureus vaccine demonstrated that vaccinated heifers injected subcutaneously in the area of the supramammary lymph node of the mammary gland at eight and two weeks before calving showed a 46% reduction in new IMI during the subsequent lactation compared with controls. In Argentina, a vaccine formulation was evaluated in bred heifers vaccinated intramuscularly at eight and four weeks and one and five weeks postpartum. This immunization program demonstrated that the frequency of new *S. aureus* IMI was reduced by 66% in vaccinated animals.

Table 3. Average cost of vaccination per cow, by herd size and by region

Operation Average Cost Per Cow ($)					
Herd size			Region		
Small (30-99) Avg.	Medium (100-499) Avg.	Large (500+) Avg.	West Avg.	East Avg.	All operations Avg.
6.58	3.92	5.46	4.48	5.61	5.41

In view of the above studies showing the success of experimental vaccines in heifers, researchers in Louisiana evaluated the commercial *S. aureus* vaccine, Lysigin®, in young dairy animals. At six months of age, 35 Jersey heifers in a research herd were vaccinated per label instructions intramuscularly, 14 days later, and at six-month intervals until calving. Results demonstrated that the rate of new IMI at freshening was reduced 44.7% and SCC reduced 50% in vaccinates compared with the 35 control heifers. Serum samples demonstrated that anti-staphylococcal antibody titers remained higher in vaccinated heifers compared to controls throughout the study suggesting an enhanced ability for heifers to combat *S. aureus* infections.

Subsequently, Missouri researchers compared two experimental *S. aureus* formulations with the commercially available *S. aureus* vaccine, Lysigin® in heifers. Animals were vaccinated twice, 28 days apart, during late gestation. After calving, they were challenged by intramammary infusion with *S. aureus* in early lactation. All quarters became infected with *S. aureus*, and at the end of the study, there were no differences in *S. aureus* clearance rates, SCC, or milk yields.

In contrast to the Missouri work, a trial in Virginia found beneficial results in using Lysigin® to manage *S. aureus* mastitis in heifers. Using 106 Holstein heifers six to 18 months of age in a commercial herd, 53 animals were vaccinated intramuscularly using a 5-milliliter dose, and 53 served as unvaccinated controls; 14 days later, the vaccinated group was boosted with Lysigin® and at 6-month intervals thereafter through calving.

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Vaccine efficacy data showed that the percentage of heifers with *S. aureus* IMI at freshening was lower in vaccinates (13.3%) compared with controls (34.0%)—a reduction of 60.9%. Also, SCC collected during the first week of lactation were lower in vaccinates compared with controls (287,000 vs. 522,000/milliliter).

Thus, the use of experimental and commercially available *S. aureus* vaccines may be used to prevent new infections when used in heifers, though studies have shown varied results. Efficacy has been shown to range between 44% to 66%, and this prevention strategy may represent a major control mechanism for managing *S. aureus* in the future, especially as new antigens and adjuvants are added to vaccine preparations to enhance their effectiveness.

The National Animal Health Monitoring System estimates that S. aureus vaccines are used on approximately 1.4% of United States dairy farms (Table 1), and tend to be more popular on very small (1.5%) and small (1.9%) herds than medium (0.8%) and large (0.3%) herds. In addition, *S. aureus* vaccines are more likely to be used in the eastern US (1.5%) than the western US (0.3%) (Table 2).

Autogenous* S. aureus *vaccines: Autogenous vaccines are those formulations that are prepared from cultures of microorganisms (specific strains of *S. aureus)* obtained from individual cows with mastitis and then used to immunize or protect other animals in that herd against further udder infection with the same strain of *S. aureus.* There is some evidence that the use of autogenous *S. aureus* vaccines can significantly elevate S. aureus blood antibody titers and reduce subclinical and clinical mastitis in vaccinated animals compared with unvaccinated control cows. In one study, use of an autogenous vaccine composed of three *S. aureus* strains resulted in 70% protection from infection and a reduction in severity of clinical mastitis in cows experimentally challenged with *S. aureus.*

Mycoplasma vaccines: AgriLabs of St. Joseph, Missouri, introduced Mycomune® bacterin, the first USDA-licensed vaccine for the prevention of *Mycoplasma* mastitis caused by *Mycoplasma bovis*. A commercially available *Mycoplasma bovis* bacterin was developed that is injected subcutaneously by giving two doses at two- to four-week intervals during the prepartum period and the third dose two to three weeks prepartum, which claims to reduce the incidence and severity of *Mycoplasma* mastitis. In a California trial conducted in 2002, blood antibodies increased fourfold and milk antibodies tenfold compared to controls after the third vaccination given two to three weeks prepartum. Importantly, vaccination was shown to prevent new infections after experimental challenge with *M. bovis* in early lactation, minimize culling of cows, and reduce positive bulk tank cultures. Additionally, milk production was maintained in vaccinates but decreased markedly in controls.

Experimental autogenous *Mycoplasma* vaccines have also been developed using specific strains from problem herds in the vaccine formulation. Preliminary data suggest that new infections are prevented, but such data are largely based on testimonials. To date, no peer-reviewed studies are available, so efficacies of commercial and autogenous vaccine attempts have not been established. One problem is that the surface antigens (molecules) of *Mycoplasma* organisms are highly variable and can change over time in response to host or environmental conditions. This makes immunization difficult because of the rapid change of antigens. The National Animal Health Monitoring System estimates that, currently, *Mycoplasma* mastitis vaccines are used on 0% of U.S. dairy farms.

For the 18.7% of dairy operations that administered vaccines to cows, the average cost of vaccinations per cow, by herd size and by region, is shown in Table 3. Costs ranged from $3.92 for medium-sized herds to $6.58 for small herds; from $4.48 for Western herds to $5.61 for Eastern herds. The average of all operations was $5.41.

Strep. uberis *vaccines:* There are currently no commercially available vaccines directed against the environmental streptococci, such as *Strep. uberis*, despite its prevalence during the prepartum period. However, many private and academic institutions are examining the development of such vaccines, and when one becomes available for efficacy evaluation, a test model must be in place to adequately evaluate the product. For example, after animal safety has been established, such a model would include: a) immunized and control heifers or cows; b) monitoring the new infection rate with the

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organism against which the vaccine was developed; and c) determining if the vaccinated animals exhibited a lower rate of infection than unvaccinated controls. This model would rely on the natural infection rate in a group of animals, which may be rather low, and would require quite a lot of time to acquire a sufficient number of infections. To increase the rate of new IMI, and therefore reduce the amount of time for product assessment, experimental challenge models have been used.

Mastitis vaccines – the bottom line: Because of universal exposure to manure, which contains *E. coli* and other gram-negative bacteria, as well as the requirement to maintain SCC as low as possible, all cows should be vaccinated with one of the coliform vaccines available on the market. These vaccines have been proven to significantly reduce clinical coliform mastitis, and have been shown to be profitable when incidence of clinical coliform mastitis exceeds 1% of the milking cows. The one commercially available *S. aureus* vaccine may be beneficial in enhancing the ability of a cow to cure herself of *Staph.* mastitis and in lowering the SCC, but is generally not recommended for adult cows. A list of commercially available mastitis vaccines is found in Table 4.

Table 4. Summary of mastitis vaccine by type, trade name, manufacturer, and administration.

Vaccine type	Trade name	,Manufacturer	Administration
Coliform	ENVIRACORTM J-5	Zoetis	3 shots: At 7 and 8 months of gestation and within 2 weeks of calving; 5cc SC or IM/shot
	J-VAC®	Merial	2 shots: At dry-off and a boost 1 to 3 weeks prepartum; 2cc SC or IM/shot
	ENDOVAC-Dairy®	Immvac Inc.	2 shots: During dry period and boost 2 or 3 weeks later; 2cc (IM)/shot
S. aureus	Lysigin®	Boehringer Ingelheim Vetmedica, Inc.	3 shots: 5cc IM; boost 14 days later, and at 5-6 months
Mycoplasma	Mycomune®	AgriLabs	3 shots: First 2 are 2 weeks apart followed by a last shot 2 to 3 weeks prepartum; 2cc SC/shot

Recipe of the Month – Cattlemen's Yeast Rolls

Courtesy of Cattlemen's Steakhouse, Historic Stockyards, OKC

- 1 3/4 yeast (wet)
- 2 ounces (4 Tablespoons) salad oil
- 1 egg
- 2 1/2 ounces (1/3 cup) sugar
- 13 ounces (1 1/2 cups plus 2 Tablespoons) milk
- 3 3/4 cup flour
- 1 teaspoon salt

Put yeast in mixer and beat on low to break up. Add oil and blend until smooth. Add egg and sugar. Mix until creamy. Replace whisk with a dough hook attachment. Add milk and mix well on low speed. Add flour, then salt. Mix on low until flour is wet and blended. Remove dough from mixing bowl and place in a larger bowl to rise. Place in a warm area with light and a towel on top. Wait for dough to rise double its volume. Punch air out of down until it is flour, and allow to rise a second time.

Roll/cut down into proper sizes. When dough is placed in a booking vessel, allow to rise a third time. When dough has doubled in size again, place in a conventional oven on center oven rack at 350° about 20 minutes or until golden brown.

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