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Iowa's Dairy Goat Industry—3rd Nationally!



When talking about the Iowa dairy industry most take for granted that we're most often talking about dairy cows. But, the dairy goat industry in Iowa continues to gain in popularity and importance.



In 2019, the **Iowa State University Extension and Outreach Dairy Team** contracted the Center for Survey Statistics and Methodology (CSSM) at Iowa State University to conduct a mail survey with dairy goat farmers in Iowa to learn more about their operation, current needs, and future expectations.

This survey was part of a research effort coordinated by Leo Timms, emeritus professor of animal science and retired extension dairy specialist at Iowa State University, and Jennifer Bentley, dairy specialist with ISU Extension and Outreach, who served as principal investigators on this project. Other ISU Extension and Outreach dairy team members Fred Hall, Melissa O'Rourke, and Larry Tranel assisted with the project.

Results provide insight on the current state of the Iowa dairy goat industry and provided through reports for dairy goat producers, educators, industry collaborators, and the public. Results will help all audiences better understand the demographics of dairy goat farms, management practices used, and the future of the industry.

Sincerely,

Jenn Bentley and Larry Tranel

ISU Extension Dairy Field Specialists, NE and SE Iowa

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Iowa Dairy Goat Survey Results

Many of you participated in this survey and here are the results! The sample for this study consisted of 215 producers drawn from a list of all dairy goat operations in the state of Iowa. Completed surveys were received from 88 farmers, for an overall response rate of 41.5%.

Of the respondents, the majority were male (97%), and average age was 43 years (22-75; 38% < 40). Forty-nine percent of dairy goat farmers got started in the dairy industry by previously milking cows, with the remaining a combination of either having parents or family members already working with dairy goats or a family member recommending raising and milking dairy goats.

Average Number of Milking and Dry Does:

2014 – 105 (range 0-700)

2019 – 155 (range 52-430)

While most operations are less than 350 head, the largest segment of goat operations has a herd size between 100- 199 head (55%). Although there has been limited growth in larger operations, small to medium sized operations have increased herd size over the last five years.

If interested in the whole survey publication of results, please visit our dairy goats and sheep tab at: <https://www.extension.iastate.edu/dairyteam/dairy-goats-and-sheep> or contact the Dubuque County Extension office at 563-583-6496 to request a paper copy.

Did you know? The percent of goat operations in the USA classified as primarily dairy rose from 11.9% in 2009 to 18.7% in 2019. Iowa ranks third nationally in dairy goats behind California and Wisconsin.

Approximately 20% of Iowa dairy operations are dairy goat producers with approximately 200 licensed operations and an estimated 50 plus non-licensed.

ISU Extension Dairy Team
"Bringing Profits to Life"

Milk production and composition

The Saanen breed is the predominant breed on 34% of dairy goat operations, with Alpine next at 27.3% (99% and 97% of herds have Saanen and Alpine, respectively). Rolling herd average is the yearly average production per doe for a herd. As shown in Table 3, over 60% of all herds had an annual milk production between 2,000-3,000 pounds per doe. Milk production is measured predominately through bulk tank only (68%) with 32% testing milk through Dairy Herd Improvement (DHIA).

As shown in Table 4, average fat and protein percent in milk produced is 3.03 and 2.69, with average Milk Urea Nitrogen (MUN) at 27.45. Average Somatic Cell Count (SCC) in milk for all herds is 986,000. Herds with higher production had a below average SCC while lower production herds had slightly higher than average SCC. Data was from August through October, reflecting mostly does in mid-late lactation.

Facilities

Milking: In reference to dairy goat milking facilities, 55% are utilizing a bucket milker with 33% hand milking. Those milking in a parlor system showed 49% with parallel parlor, 26% parallel parlor with a rapid exit system, 3% herringbone, and 1% carousel (rotary) parlor. A majority of smaller herds, under 100 head, are hand milking, while larger herds are using a pipeline or parlor system. On average, 15 does can be milked at one time in their milking system, with 57% most commonly milking between 10 and 20 does at one time. All dairy goat operations milk twice a day. On average, 99 does per hour are milked depending on facility type; an average of 66 does per hour for bucket and between 110 and 130 for most other types of milking systems.

Housing: Seventy-six percent house their milking herd in a bedded pen with either a dirt or paved lot, while 24% house milking does in a bedded pen with total confinement. Operators have more recently updated milking equipment and facilities compared to housing facilities. Facility changes in the next 5-10 years was a lower priority due to the high percentages that have made facility changes and upgrades in past 10 years.

Dairy farm management

Respondents were asked questions regarding practices and records utilized in their operation.

Veterinary service: The main service operations seek from veterinarians is treatment recommendations, while treatment protocols, herd health, preventative practices, and education are other services producers commonly utilize. Eighty-five percent responded they have veterinarians in their areas with dairy goat experience. Forty-four percent utilize veterinary services 3-5 times a year, while 38% use only once a year.

Milk marketing: When selling milk, 48% of producers market milk through an independent processor, 44% market through a dairy farm cooperative, and 5% market to an organic dairy cooperative.

Records: Only 7% of operators use a computer to keep records for their operations, with 49% not keeping production records on individual goats. Those who do keep records use DHI records, PCDART, or another method.

Health and reproductive management: Operators employ a variety of practices and technologies to manage their dairy goats and operation. As listed in Table 5, common practices used include hoof trimming, deworming methods, routine vaccinations, individual doe SCC testing, external parasite control, and milk culturing. Operations are less likely to engage in practices related to dry doe treatments and reproduction practices such as AI or heat detection aids and breeding out of season.

Table 5. Dairy goat management practices, use rate

Do you currently use any of the following dairy management practices or technologies?	
ANSWER	PERCENT
Hoof trimming	97
Deworming methods	94
Routine vaccinations	80
Individual doe Somatic Cell (SCC) testing	64
External parasite control on all animals	58
Milk culturing to identify mastitis	39
Dry doe treatment	17
Synchronization program for reproduction	11
Artificial insemination (AI)	2
Heat detection aids such as patch, chalk, paint	1
Breed out of season using lights	1
Breed out of season using hormones	1

Table 3. Annual average milk production, pounds per doe

	POUNDS	PERCENT
	501-1000	1.1
	1001-2000	31.8
	2001-3000	61.4
	3001-4000	1.1
	Don't know	2.3
	Missing	2.3

Table 4. Average dairy goat herd components

	FAT	PROTEIN	MUN	SCCx1000
Average	3.03	2.69	27.45	986
St. Dev ±	0.25	0.16	3.15	288
Minimum	2.60	2.40	19.00	500
Maximum	3.80	3.20	35.50	1960

Table 6. Pre- and post-milking practices, use rate

PRE-MILKING PRACTICE	PERCENT USE
No pre-milking sanitation	48
Forestrip milk from teats	23
No drying of teats with towel	20
Dry teats with individual towels	15
Predip with commercial teat dip	13
Sanitation wipes	11
Wash with liquid and a common towel	10
Dry teats with a common towel	8
Predip with homemade solution	7
Wash with Udder Wash and individual towels	6
Wash with water and individual towels	5
POST-MILKING PRACTICE	PERCENT USE
Check udders for milkout	73
Postdip with commercial dip	23
Postdip with homemade solution	4

Milking management

Dairy goat operators were asked about pre and post milking practices as part of their milking management (Table 6). Forty-eight percent of respondents use no pre-milking sanitation. The remaining 52% used a variety of Pre-milking



sanitation practices (towels and sanitation wipes, commercial teat dip, homemade solution, or water) but only 23% dried teats prior to unit attachment. Only 23% fore-stripped teats prior to milking. Seventy-three percent of operators check udders post milk-out, with 27% utilizing a commercial or homemade solution for post-dip.

Doe management

Eighty-one percent of operators average a dry doe period of 60 days, with an average length of lactation of 300 days. The majority of does are moved into the milking string between one- and four-days post kidding. Ninety-four percent of first lactation does freshened at one year of age.

Kid management

Producers were asked how soon after birth the average dairy goat kid receives colostrum. Twenty-seven percent responded less than one hour after birth, 55% within 1-2 hours after birth, and 16% within 2-4 hours after birth.

On average, first feeding colostrum amount fed is 8.77 ounces (4-20 ounces); with a second feeding average of 7.85 ounces (0-24 ounces). Table 7 shows sources of colostrum fed. Thirty-six percent use visual appearance as a method to estimate immunoglobulins or colostrum quality in first kid feeding. Eight percent use volume of first milking colostrum, while 1% utilize a refractometer. Less than 2% of all operators routinely monitor serum proteins as a measure of passive transfer status of newborn kids.

When feeding dairy goat kids, 63% of producers utilize a lamb bar with multiple nipples, 32% utilize individual bottle feeding, 10% a free choice cold milk feeding program, 6% doe raised milk, and 3% utilize an automatic feeder. The remaining feed using a combination of buckets or bottles with nipples, an individual pan, or feeding trough.

Eighty-six percent of respondents feed kids twice a day, utilizing milk as shown in Table 8. The majority of producers wean kids by age; followed by grain/starter consumption and bodyweight. The average weaning age of doe kids is 52.6 days (35-90 days); with an average weaning weight of 23.5 pounds (10-40 pounds). Buck kids are weaned around the same age at 50.4 days, weighing 24.4 pounds

Table 7. Sources of colostrum fed, ranked by response

	YES, PERCENT	PREDOMINATE SOURCE, PERCENT
Raw colostrum from fresh doe	43	28
Commercial colostrum bovine based	43	31
Heat treated goat colostrum	29	22
Other commercial colostrum/ goat colostrum replacer	11	7
Heat treated cow colostrum	1	0
Raw cow colostrum	1	0

Table 8. Type of milk fed to kids, ranked by response

TYPE OF MILK FED TO KIDS	PERCENT USE
Milk replacer (formula intended for goat kids)	86
Unpasteurized goat milk	30
Pasteurized goat milk	16
Unpasteurized cow milk	8
Milk replacer (formula intended for lambs)	2
Pasteurized cow milk	1



Feeding management

Dairy goat producers feed their milking herd one of three ways: 72% utilize grain feeding only while milking 42% limit feed with all animals having equal access 27% always have feed available. Primary forages include alfalfa hay; grass hay; and baleage. Additional forages include haylage, silage, and small grains. Feed allowances are based on individual milk yield, bodyweight, and pen average.

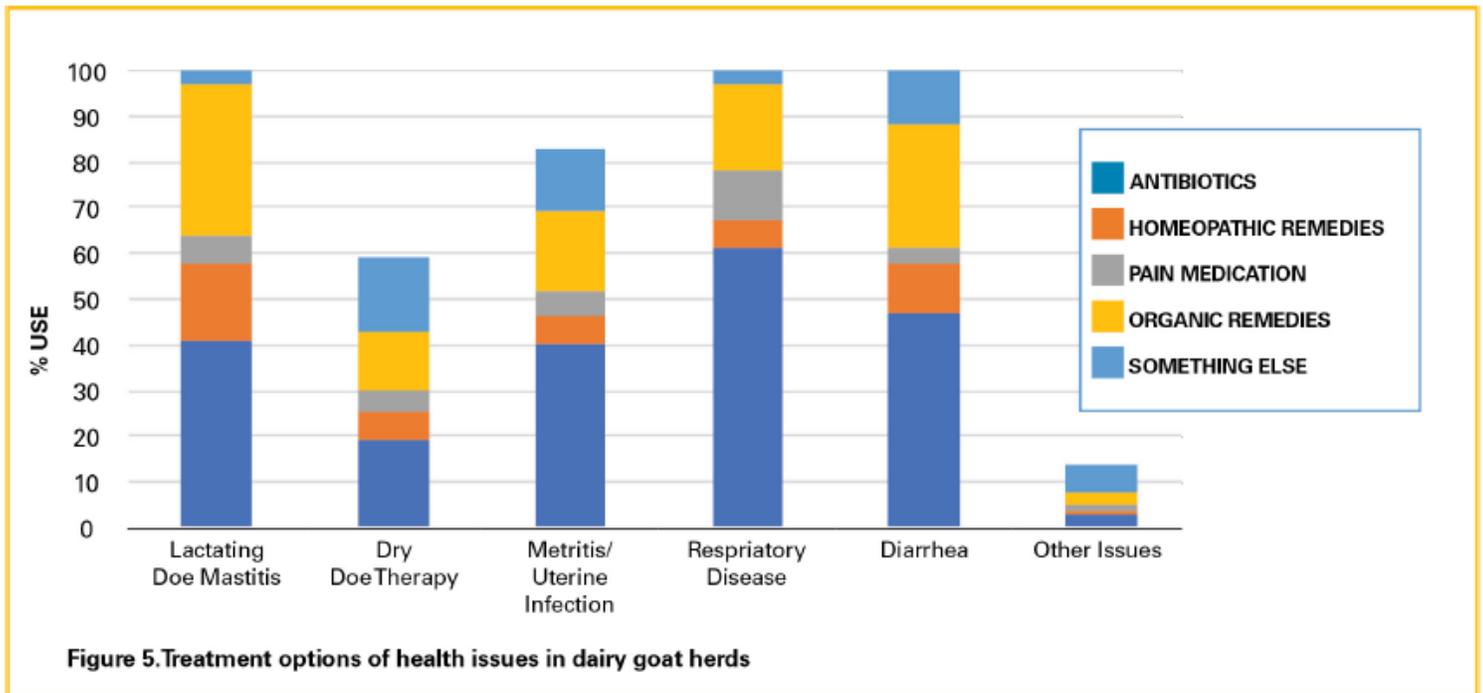
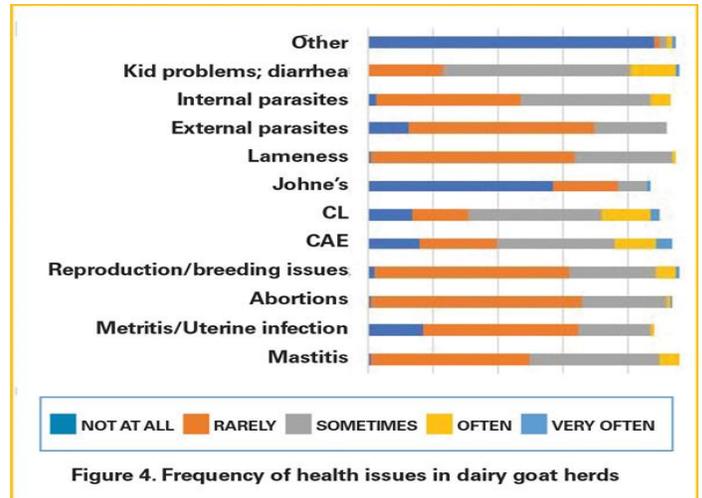
Eighty-nine percent feed using a forage in the trough or feeder with a separate concentrate supplement. Three percent utilize a total mixed ration, while 5% feed forage only. On average, 3.4 pounds of concentrate feed is fed to each milking doe per day (2-10 pounds). Within all animal groups, 50% feed once per day and 20% feed twice per day. Producers feeding the herd using a total mixed ration push up feed three times per day. Vitamins and minerals are provided primarily through free choice in the trough, included in the There are many health issues dairy goat producers face in their operations. Those most commonly found are diarrhea in kids; CL (caseous lymphadenitis); internal parasites; mastitis; and CAE (caprine arthritis-encephalitis).

Figure 4 describes the frequency of all common health issues in dairy goat herds from not at all to very often. Only 26% of operations test for CAE, CL, or Johnes. If an animal does test positive, the animals are most commonly separated from the herd or sold. Treatment for health issues are managed in a variety of ways. Figure 5 describes the different treatments used for dairy goat health issues.

concentrate mix, or provided as a lick block and included in the total mixed ration if fed.

Water is available in 40% of operations by using an automatic water and nipple system; 28% utilizing a water tank or a combination of both watering systems. There are multiple ways producers manage the nutrition of their milking does. The majority of producers manage nutrition with the assistance from a feed mill, co-op, or feed store, with a combination of managing nutrition on their own, working with a nutritionist, or assistance from other dairy goat producers.

Health issues and management



The main reasons animals leave dairy goat operations are due to low milk production; mastitis and udder problems; death; illness or injury; foot or leg problems; sold to someone else for milk production or breeding; or culled due to disposition.

Other reasons noted by producers include somatic cell count, reproduction, CAE, or too many replacements already in the herd.

Crop and manure management

The average acre base per farm in 2019 was 91 acres for owned land and 17 acres for rented land. Total land base ranges from 0-300 acres owned and operated, while rented and operated ranges from 0-200 acres (Table 10).

Financial management, pricing, and issues in the dairy goat industry

Ninety percent of producers responded that dairy goats are profitable at current prices. The current average price per hundredweight of dairy goat milk received is \$37.91, with a range of \$25 to \$57. The average pricing they receive for buck kids is \$45, cull does is \$115, and replacement female kids is \$142.90. Eighty-nine percent of operations sell buck kids; with 43% selling at 10 days of age or younger and 44% selling 90 days or older, averaging 67 days old when sold. Only 18% of respondents know what it costs to produce a hundred pounds of dairy goat milk, averaging \$22.33. Currently, producers indicate that commodity prices, bacteria count, and somatic cell count are the top three conditions that have significant impact and concern on their dairy goat business.

Future of Iowa dairy goat industry

Participants were asked questions pertaining to the future of their dairy goat operation (Table 12). Forty-nine percent indicated they plan to expand their herd in the next five years. Herd expansion equaled average growth by 88 milking does. Thirty percent respondents projected updating facilities and equipment during the next 15 years.

Today's operators plan to stay in business as the majority of respondents do not plan to retire, discontinue milking, or sell the operation in the next 15 years.

Conclusion

Dairy goat producers see their herds as profitable, plan to continue to stay in the business (49% plan to expand) and expressed needs for enhanced education and service. This

survey provides the platform of the existing industry while also forecasting needs and educational areas.

ISU Extension and Outreach received an exploratory grant, (13984) with the North Central Risk Management Extension

Education Center. Collaboration also came from Paul Plummer, DVM and director of the National Institute of Antimicrobial Resistance Research and Education at Iowa State; the Iowa Dairy Goat Association; Saputo Cheese; and Mt. Sterling Coop.

Table 10. Average acres of farmland operated in 2014 and 2019

	CURRENT 2019	2014
Total acres owned and operated	91 (0-300)	66 (0-700)
Total acres rented and operated	17 (0-200)	15.5 (0-182)
Acres in pasture	19.4 (0-90)	14.6 (0-90)
Acres in corn for grain	17.5 (0-100)	
Acres in corn for silage	1.75 (0-18)	
Acres for hay or haylage (including new seeding)	22.8 (0-70)	
Acres of oats, barley or other small grains	9.6 (0-45)	
Acres of soybeans	13 (0-80)	
Acres of other crops (cover crops, small grains, produce)	3.5 (0-62)	

Dairy Goat Management Calendar –

The tasks of raising dairy goats is a year round effort. What to do and when to do it? Here's a year-round guide:



SPRING

To prepare for kidding have kidding area cleaned and bedded with fresh straw several days before the doe's due date. A good supply of equipment includes items in this checklist:

- A good light in the delivery area.
- A clean bucket for water.
- Surgical scrub such as Nolvosan, or a bottle of mild detergent (Ivory, Joy) for cleaning hands and the vulva of the doe.
- Obstetrical lubricant (Lubrisept, K-Y) and, if possible, disposable obstetrical gloves for assisted births.
- Dry towels for cleaning and rubbing kids.
- Iodine (7% tincture) for dipping navels. A small jar or film canister for individual use is handy. Dip navel immediately after birth, and repeat in 12 hours.
- Scissors for umbilical cord.
- Keep frozen colostrum from a safe, CAEV-free source. To heat-treat colostrum, heat colostrum to 135°F in a double boiler or water bath and maintain temperature for one hour.
- Clean bottle and nipple for feeding colostrum.
- Feeding tube (12-18 French) and large syringe (35-60 cc, with catheter tip) for giving colostrum to weak kids.

CAE Prevention

- Tape doe's teats one week before due date with teat tape. This will prevent kids from possibly nursing a CAE-positive doe.
- Segregate CAE-positive parturient does from the rest of the herd to prevent horizontal transmission from infected genital secretions.
- Remove kids from doe immediately after birth.

- Feed colostrum from a safe source within the first couple hours after birth. Give 10% of kid's body weight within 18 hours (e.g., 13 oz. for an 8 lb. kid). Then feed pasteurized milk, CAE-free milk, or milk replacer.

Nutrition for the doe

- Have pregnant does on a rising plane of nutrition in late gestation, i.e., good quality grass hay, supplement with some leafy alfalfa. Gradually increase grain ration in last few weeks to provide energy.

Disease Prevention: Does

- Be sure does are boosted for CDT in last 4-6 weeks prior to due date. Consult your veterinarian for advice on selenium supplementation for does and kids in deficient areas.
- Deworm doe 1-2 weeks postpartum.

Disease Prevention: Kids

- Begin Coccidiosis preventive or start monitoring fecals by three weeks of age.
- CDT series at 4, 8, and 12 weeks of age.
- Begin deworming at 6-8 weeks.

SUMMER

- Be sure kids have gotten their CD-T boosters (e.g., 8 – 12 – 16 weeks).
- Wet weather has given parasites a big boost in many areas. Practice regular helminth (worm) control in all groups of animals. Doses of dewormers in goats are usually 2X the cow or sheep dose (4X the cattle dose for Fenbendazole–PanacurR). In the case of Ivomec, use the oral formulation. Resistance to all dewormers is appearing, so monitor success with quantitative fecal exams.
- Rotate pastures every several weeks, if possible.
- Coccidiostats for kids.

- Check for external parasites; keep animals clipped and clean.
- Be careful with grain overload during peak lactation, and when getting ready for show. Increases in concentrate feed must be made gradually, over a couple of weeks.
- Be sure fresh water is present at all times. Consumption goes way up in warm weather, and during lactation.
- Monitor presence of poisonous plants which may have grown within reach of animals.
- When hauling in hot weather, provide good ventilation. If you break down, will animals have fresh air and water?
- At show time, be careful not to “over-udder” a doe, as she can develop an allergic reaction to backed-up milk under pressure.
- Build buck up for breeding season. Give him Vitamin-E/Selenium in Selenium-deficient areas. Keep feet trimmed. Give him a good diet of forage and increasing amounts of concentrate in late summer.

FALL

The Buck

- Check and trim feet. Treat foot rot as necessary.
- Check teeth on older bucks.
- Shorten or remove scurs prior to breeding season.
- Clip belly. Examine penis and prepuce for injuries and inflammation.
- Check general body condition. Improve nutritional status if too thin.
- De-worm.
- Bo-Se in selenium-deficient areas.

The Doe

- Check and trim feet before rainy season.
- Correct body condition before breeding, especially if she is too fat. Fat around the ovaries may cause poor fertility. In general, corrections in body condition (too thin, too fat) are easier and safer to make before the doe is dried off.
- Bo-Se in selenium-deficient areas.
- Do milk cultures now, to pick up subclinical mastitis.
- Consider dry treating the herd, where mastitis has been a persistent problem.

The Herd

- Check fecals in different age kids) – to evaluate parasite accordingly.
- Consider fall deworming, summer pasture.
- CAEV testing: Kids over 6 months old, new additions to the herd, any animals of questionable value or condition. Cull accordingly. Feed as few animals as possible through the winter.



categories (does, loads. Treat

coming off

WINTER

- Pregnancy check does early enough to be able to rebreed this season if open.
- Booster vaccinations (Clostridium perfringens C & D, and Tetanus) in mid- to late-gestation at least 6 weeks prior to kidding. This promotes high colostrum antibody levels at parturition.
- Booster Vitamin E-Selenium in mid- to late gestation, in Selenium deficient areas. This bolsters uterine muscle tone and helps prevent uterine inertia and retained placentas.
- Get does into their desired body condition while they are still milking; e.g., if too fat, reduce grain before drying up. Don't dry her up and then starve her. There will be fewer problems with pregnancy toxemia if weight changes are made while doe is still metabolically active.
- Pregnant does should get plenty of exercise. Fit and trim does are easier to freshen, less susceptible to pregnancy toxemia.

- Don't feed 100% alfalfa as a ration, especially to does in late gestation. Balance with grass hay so that does can mobilize their own calcium at the time of freshening.
- Keep an eye on geriatric animals for weight loss and chilling.
- Routine foot care for all animals.
- Monitor for external parasites (lice) during this period where animals may spend more time indoors with less sunlight.
- Eliminate moldy feed.
- Get to know and enjoy your animals better during this slow time!

written by Mary Blankevoort, DVM, for the American Dairy Goat Association

FDA Proposes a Transition to No Over-the-Counter Antibiotic Use – What does this mean for the dairy goat producer?

By Jenn Bentley and Dr. Paul Plummer, DVM

We have known for a very long time that antibiotics are very useful medicines to help fight bacterial infections. Did you know that Sir Alexander Fleming “accidentally” discovered Penicillin in 1928? In 1945, he shared a Nobel Peace Prize with those that developed the technology to mass produce it, as it saved the lives of many soldiers during WWII and many lives since, both human and animal. However, during his Nobel prize acceptance speech he highlighted the risk of bacteria becoming resistant to the effects of the antibiotic (a term we now call antibiotic resistance), a phenomenon that he had observed within days of discovering the new drug. In his words from his acceptance speech “The thoughtless person playing with penicillin treatment is morally responsible for the death of the man who succumbs to infection with the penicillin-resistant organism.”

Now, more than 40 years later, antibiotics have been approved by the Food and Drug Administration (FDA) and have made possible many of our modern human medical practices including organ transplant, chemotherapy improved outcomes for prenatal birth and a longer lifespan. They are also critically important to treat sick animals, prevent illness, and maintain the health of animals. Unfortunately, **every** time we use antibiotics, we place additional pressure on the bacteria to develop resistance, just as Sir Alexander Fleming observed after his first use of penicillin. However, assuring that we use the correct antibiotic, at the correct dose, for the correct duration to treat a known disease helps to minimize antibiotic use and slow the development of antibiotic resistance. Next month the American Veterinary Medical Association will be releasing a report demonstrating increasing antibiotic resistance to common livestock pathogens including several goat specific pathogens.

This rising level of resistance means that goat diseases that we have previously been able to control with antibiotics are becoming more difficult to treat. Likewise, antibiotic use in humans is soaring and unfortunately there are very few new antibiotics in development due to the extreme cost of drug development and a poor financial return of investment for antibiotics due to short term treatment regimens and limited usage.

Current estimates suggest that approximately 2000 people die worldwide each day due to antimicrobial resistant infections. This means that in the five months since the first reported case of Covid-19 on November 17, 2019, approximately 480,000 people have died due to antimicrobial resistance, a number that is very similar to the number of global deaths due to Covid (600,000 as of July 20, 2020) in the same period. These stark realities force us to re-examine the way we use antibiotics and make sure that all uses, for humans and animals, are necessary and warranted.

Hence, on January 1, 2017 the Veterinary Feed Directive came into law. This regulated how medically important antibiotics (antibiotics that are used to treat humans) are administered to animals in the **feed or water only**, and applied to all farm animals, regardless of species or size of operation. This directive no longer allows farmers to go to a feed store and buy medicated feed or water-soluble antibiotics, without a prescription from a veterinarian.

Farmers made responsible use of these antibiotics a priority, worked closely with their veterinarian to make sound herd health decisions, without jeopardizing the health of their animals. The FDA reported that sales and distribution of all medically important antimicrobials, or those important to human health, for food-producing animals decreased 33 percent in 2017.

As a follow-up to the Veterinary Feed Directive, the FDA is now proposing banning the sale of over-the-counter antibiotics, as part of its 5-year antimicrobial stewardship program. Again, an OTC drug is one that can be



purchased at a feed or farm supply store or from a mail order catalog, including over 100 animal drugs considered to be medically important for human medicine.

Many antibiotics on FDA's list are still commonly used by goat producers to treat common disease conditions, such as pneumonia, mastitis, scours, and footrot. These include penicillin, cephapirin (mastitis tubes), sulfas, tetracyclines, and spectinomycin.

FDA is implementing this program over a 2-year timeframe and once in effect, farmers will be required to get a veterinary prescription to administer an

antibiotic to their livestock. In order to get a veterinary prescription, the farmer must have a valid veterinarian-client-patient-relationship (VPCR) to do so. This means, the veterinarian must have regular visits and familiarity to the farm and animals in order to prescribe antibiotics. In some locations, it may be a challenge to find a veterinarian who has knowledge in small ruminants, so it is important to develop these relationships now before the implementation occurs.

What does this mean for the dairy goat producers? From a legal perspective, while most of the products listed above are currently available over the counter, it is illegal for them to be used in goats without a vet prescription. Most of these products do not have a direct label on the bottle for goats and so they are already considered "extra-label" use, meaning that there are additional very specific guidelines from FDA including the need for a VPCR veterinary prescription. As such, the need for a veterinary prescription is legally already in place for the use of these drugs. When this rule is finalized producers will not be able to purchase these products without the prescription.

While, this has the potential to increase the cost of using antibiotics, it may also decrease the use of antibiotics. By establishing a VPCR, a farmer may better understand or utilize preventative health care practices; including better facilities, nutrition, biosecurity or improved genetically sound animals. If antibiotics are still needed to take care of the animals, then a working relationship has already been established and a prescription to utilize the antibiotics under veterinarian guidelines can still be conducted for the health of the animal. Farmers want their animals to be healthy and care about providing a safe, secure food supply for human consumption. As animal agriculture learns more about

antibiotic resistance and the role we all play, establishing these guidelines now will reap a positive, healthy outlook for the future of the industry.

For more information on antimicrobial resistance research and education, visit the National Institute of Antimicrobial Resistance Research and Education based at Iowa State University in Ames, under the direction of Dr. Paul Plummer. www.niamrre.org

ISU Research Update:

A team of researchers led by Drs. Paul Plummer and Jan Shearer from the College of Veterinary Medicine at Iowa State University is engaged in a study to assess well-being of dairy goats and develop training materials to aid dairy goat producers. Support for these research and extension activities is from the United States Department of Agriculture's, Agriculture and Food Research Initiative (USDA AFRI) and Saputo, Inc., a Montreal based dairy company. The aim of the ISU studies is to improve dairy goat well-being through an on-farm assessment of management and husbandry practices to establish benchmarks of individual farm performance. In addition to the benchmarking study, the team is conducting research on the following:



1. pain control and novel approaches for disbudding of dairy goat kids
2. use of cautery disbudding procedures potential brain damage in neonatal goat kids
3. novel methods of goat euthanasia

In order to aid dairy goat producers a series of welfare training modules are nearing completion for release in the near future. Four training modules including disbudding of dairy goat kids, euthanasia of adult dairy goats and dairy goat kids, hoof trimming of dairy goats and transportation of dairy goats. Modules will include video presentation of training materials and plans are in progress to have these materials reproduced in French and Spanish. Dairy goat producers are encouraged to stay tuned for further updates on these and other efforts to support the dairy goat industry in the near future.

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Goat Reproduction— Using AI

This article is an
excerpt from
Extension



Artificial Insemination in Goats

Placing semen from the male into the female is called artificial insemination, or AI. Usually, for the females to be bred by AI, the estrous cycle is synchronized so they will all show heat at a similar time. This reduces the time and labor for heat checking. Some estrus synchronization programs are designed so the females can all be inseminated (bred) at a fixed time without having to check heat. For more information on hormone programs for AI see:

<http://www.extension.org/pages/63472/estrus-synchronization-for-timed-artificial-insemination-in-goats> or

<http://www.extension.org/pages/19331/goat-reproduction-estrus-synchronization>

The benefits of A.I. include: faster genetic improvement; reduced sexually transmitted diseases; reducing cost of maintaining bucks; and accuracy of predicting when kids are born. The big downsides are time and cost.

Conception rates achieved when using cervical AI range from 50 to 70% with timed AI, and 70-80% with breeding by heat check, though rates with any AI are typically lower during spring and summer months. Photoperiod treatment of bucks during the spring and summer months might assist in alleviating the impacts of season. For cervical AI classes or contacts, visit the website of Iowa Dairy Goat Association, or AI trainers such as BIO-Genics, LTD at <http://www.biogenicsltd.com> (this is not an endorsement). For a video of AI in goats

<http://www.youtube.com/watch?v=vF89Ar83M7g>

More information about AI (dairy goats):

http://aces.nmsu.edu/pubs/_d/d-704.pdf

How to Start AI (Artificial Insemination)

Adapted from article by Guinevere McIntyre www.iowadairygoat.org

Getting started with AI is easy and incredibly fun and exciting with all the possibilities it opens up for your herd. There's just a few things you will need to invest in, or have access to: 1) A semen tank 2) A liquid nitrogen supplier 3) An A.I. kit 4) A class with a good teacher and 5) Semen straws

THE TANK: There are many options on the market, new and used. A new tank will be pricier but may be more efficient/require fewer fillings of liquid nitrogen throughout a year. I use a good sturdy used tank that I refill every 6 to 8 weeks for about \$17....

THE LIQUID NITROGEN SUPPLIER: If your tank runs dry (runs out of liquid nitrogen), the potential of all those goat daddies in there just disappears. So it is very important to stay on top of this. If you're like me, you may not know of any suppliers as a newbie to AI...ask around, again, with goat people, cattle people, your vet, and especially at feed stores. Some will come to your house on a schedule – mine lives near me and I just pop over for a refill.

THE AI KIT: If you're going to take a class, it can be best to buy your kit through them, as then you will have the same equipment they are using for demonstration. You can assemble the components of a kit separately, but often the kit includes useful items you might not think to add, all in a handy container.

THE AI CLASS: Not necessary but highly recommended. As my mentor said, you can just buy a kit and read the instructions. They do come with instructions. I took a class also and learned SO much more, so I don't know how things would have gone with the instructions-only approach, perhaps just fine. My 2-day class with Bio-Genics was really excellent. IDGA has also offered a fantastic one-day hands-on practical clinic, and plans are always in the works for more.

IDGA posts AI clinics, classes, and workshops in the central Midwest area on our Regional Events Calendar. If you see one is happening, my advice is to go if you possibly can, as they can be few and far between.

SEMEN STRAWS: There are many possibilities for getting some frozen daddies for your goats – in getting started, you may know someone nearby who would be willing to sell you a few straws. Researching bucks and purchasing semen is fun and, believe me, addictive – you can end up with PLENTY of options in your tank fairly quickly! You can purchase semen through the various goat collection agencies, such as Bio-Genics above, or:

<http://www.hawkeyebreeders.com/>

<http://www.superiorsemenworks.com/>

<http://www.thebuckbank.com/bucksemencatalog.htm>

Hawkeye Breeders is in Adel, IA, just outside Des Moines. You also can purchase straws directly from breeders. Sales are often held through the various yahoo chat groups or Come to the Farm. This will require the use of a vapor shipper which is another chunk of money unless your liquid nitrogen supplier or a friend can loan you one.

Yes, there is more to AI. This is just a "Getting Started" page, but it does give you everything you need to know to get going. There are countless bits of advice on how to do a successful AI, but most importantly, follow the directions carefully every time, from your class or from the AI kit.

Mastitis and Milk Quality: Working through late lactation, dry off, & back to kidding: *by Leo Timms*

Milk quality and mastitis are always challenges for goat producers but late lactation accentuates this. Many understand the challenges of early lactation with the demand for milk production for commercial use or feeding multiple kids, and meeting that demand nutritionally.

But why increased risks in mid-late lactation. 3 major reasons:

1) breeding season brings hormonal shifts with estrus that lead to slight immune suppression (and all does are here at once); **2)** late lactation means less milk and udder pressure, so lower flushing effect of organisms unless proper milking stimulation and practices are followed; and **3)** reduced appetite and increased aggressive behaviors (stressors) during breeding season, especially if bucks are introduced amongst the whole herd. Some of these are inevitable but others can be addressed with enhanced best management practices.

Defining a milk quality problem

doe: This is the #1 priority no matter what stage of lactation. Certainly, **active aggressive surveillance and identification of clinical mastitis** through examining milk, udder conformation and abnormalities, and overall animal health are crucial. But **most mastitis is subclinical** or unseen so use of tests like **culture (infections)** or **somatic cell counts (SCC) (electronic or CMT doe side)** are essential.

Cultures are useful, especially in defining if mastitis is contagious or not, as well as directing prevention and treatment strategies. The easiest, cheapest way (and many goat producers use this) is **CMT or paddle test**.

Interpreting and using CMT results: CMT works by mixing milk with detergent that coagulates somatic cells (gel reaction). The more cells, the greater gelling. Most producers who screen their does look and usually only define mastitis by **does that gel the paddle the worst (thick grape jelly)**. While this is a problem doe, that jelly represents a **10-50 million SCC**. But what about **does (and there are many) that gel the paddle where it can be seen moving a little sluggishly but still moving. This represents SCC > 1 million** and still a problem doe with mastitis (maybe not high enough to trigger warning letters at this point but that can change).

So in most herds we work with, many does have positive CMT's and high numbers of problem does. My challenge is how many of your does or udder halves gel the paddle (now, late lactation, kidding?) Don't be afraid of results. Use them to understand and possibly culture problems, define solutions to keeping low SCC does clean (milking order / pens) and developing strategies to address high SCC, infected does.

Organisms and cultures: Some does may have **contagious** mastitis (Staph aureus) so identifying and eliminating these does or minimizing their spread at milking is critical. Most other organism (streps & coliforms) are **environmental** (bedding, feces, H₂O) or from **skin (CNS or skin staph)**. So practices to lower organism loads on teat skin and the environment, even late lactation, is critical!!

Strategies to address milk quality/mastitis risks

Should be year-round but enhanced late lactation. Focused on reducing germ load or stressors!

- Clean, dry environment (reduce germ load)
- Proper nutrition (enhanced immunity)
- Proper milking practices: stimulation times for effective, cleaner milkout; and **pre-post milking sanitation** (teat dipping and drying) to reduce organism load, improve teat skin, improve milkout stimulation, and reduce risk!!
- Consider pen breeding if possible using bucks. Reduces stress amongst breeding groups and has shown reduced SCC in trials

Dry off: Being prepared and carrying through to kidding: Body condition of does at dry off and proper management practices during the dry period are critical for a successful next lactation.

- Proper body condition (not thin or heavy) is critical and should be maintained during dry period. Also, good properly trimmed feet!
- Proper nutrition, clean environments, and excellent ventilation. Work with nutritionists on extra needs of does with twins or greater.
- If administering anything intramammary, be clean (alcohol pads / clean techniques)!

Kidding time and beyond: Keep those **great nutrition and environment practices** going and make sure **milking practices** optimize doe milk flow and reduce her infection risks (teat skin, environment). **Consider CMT or paddle testing all does** at kidding (or during week 1). Make sure milk (colostrum) and detergent mix thoroughly (use fingers but clean between) before interpretation.

Eliminating existing infections: Dry therapy: Administering commercial intramammary antibiotic tubes at dry off is an excellent way to cure existing infections with minimal residue risks. This should be done only with veterinary supervision and guidance and a valid VCPR as appropriate therapies will need vet expertise and prescription. Consider only treating positive CMT or problem udder halves to reduce costs and risks.

ISU research: We completed a lactating doe study and have a grant in for dry therapy to better define dosages / withdrawal times / decisions. Stay tuned!

Managing Dairy Goat Finances

by Larry Tranel, Dairy Field Specialist, ISU Extension and Outreach



Helping producers understanding Dairy Goat Finances has been a specialty of mine as I was honored to write a chapter in the National Dairy Goat

Handbook on Managing Dairy Goat Finances. I also developed the Dairy Goat TRANS software program to help producers use Schedule F incomes and expenses, coupled with an assets inventory and other other items to do a full-fledged financial analysis.

Our ISU Extension and Outreach Dairy Team uses the Dairy Goat TRANS program to help producers analyze their dairy goat operations. Many dairy producers struggle with how to best analyze their operations to determine if and how much money is being made or lost. Using Dairy Goat TRANS in 2008, we did a dairy goat financial study that even though a bit outdated, still has applicability for the profitability (or lack thereof) and concerns of the industry.

To the right is a SAMPLE dairy goat budget. The biggest variables seem to be the price of feed and the price of milk, no surprise there. But, in addition, labor efficiency can also play a big part as well as the facilities that can impact labor, milk production, feed intake and a host of other items.

Like dairy cow farms, dairy goat farms differ greatly in both the incomes and expenses of any given operation. Thus, the important part is to use your own numbers to get a ballpark feel to the profitability of your dairy goat enterprise. The cost of production can easily vary 25% from a neighbor's farm. The goal is to benchmark against industry data and become better and more profitable.

The budget below uses a per Doe column but can also multiply to any given herd size. A herd of 150 does is used for the example. This budget is available on the ISU Extension Dairy Team page for producers to enter in their own numbers or estimates. This budget has been extremely useful to beginning producers as many seem to get into the dairy goat milking business thinking that more money is going to be made than tends to happen in reality. For some, that would have been better to know before investing so heavily in a dairy goat herd.

Once of the biggest concerns for beginners is the genetic capability of the herd being bought as genetic improvement hasn't been widespread in the industry and tends to come slower than dairy cow herds due to less AI used. The other big concern is herd health as lots of kids coming all at once can be overbearing the first time through. Yes, I speak from experience here as I used to be a dairy goat producer and am quite fond of goats.

ISU Extension Dairy Goat Budget					2020	
<u>Cash Incomes</u>	<u>Price</u>	<u>Unit</u>	<u>Quantity</u>	<u>Per Doe</u>	<u>Does in Herd</u>	
				1	150	
Milk Sales	\$39.00	cwt	17.00 cwts	\$663.00	\$99,450	
Buck Kids	\$8.00	head	0.90 head	\$7.20	\$1,080	
Cull Does	\$75.00	head	0.25 head	\$18.75	\$2,813	
Doe Kids	\$30.00	head	0.40 head	\$12.00	\$1,800	
Other Income				\$2.00	\$300	
Total Incomes				\$702.95	\$105,442.50	
<u>Cash Costs</u>						
Forage dry matter	\$150.00	ton	0.90 tons	\$135.00	\$20,250.00	
Grain Mixture	\$0.160	lb	1350.0 lbs	\$216.00	\$32,400.00	
Milk Replacer	\$2.40	lb	12.5 lbs	\$30.00	\$4,500.00	
Supplies				\$45.00	\$6,750.00	
Vet Fees/Medicine				\$10.00	\$1,500.00	
Bedding	\$100.00	ton	0.15 tons	\$15.00	\$2,250.00	
Fuel	\$3.00	gallon	2.00 gallons	\$6.00	\$900.00	
Custom Hire				\$2.00	\$300.00	
Utilities				\$17.00	\$2,550.00	
Repairs				\$12.00	\$1,800.00	
Other Expenses				\$12.00	\$1,800.00	
Total Cash Costs				\$500.00	\$75,000.00	
<u>Investment Costs</u>	<u>\$ FMValue</u>		<u>Depreciation</u>	<u>Interest</u>		
Equipment/Parlor	\$40,000		5.0%	4.0%	\$24.00	
Building/Housing	\$30,000		7.5%	4.0%	\$23.00	
Machinery/Other	\$10,000		5.0%	4.0%	\$6.00	
Livestock	\$55,500					
Does	\$300	head	0.0%	4.0%	\$12.00	
Kids	\$200	head	0.0%	4.0%	\$2.00	
Bucks (20 does/buck)	\$400	head	33.0%	4.0%	\$7.40	
Total Investment	\$135,500		Investments Costs		\$74.40	
				Total Costs	\$574.40	
				Net Return to Labor	\$128.55	
Labor Costs	\$8.00	hour	17 hours	\$136.00	\$20,400.00	
				Net Return Over Total Costs	-\$7.45	
				Approximate Rate of Return on Assets	3.2%	
prepared by Melissa O'Rourke, Farm Management Field Specialist, Kristen Schulte, Farm Management Field Specialist and Larry F. Tranel, Dairy Field Specialist, Iowa State University Extension						
1) This budget is a general estimate for educational purposes only.						
2) Producers are encouraged to determine their own budget for their particular operation.						
3) Costs on dairy goat farms vary considerably due to genetics, production levels, feed costs, management, labor efficiency with numbers of does milked with equipment and parlor investment, etc.						

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