

Care of the Nigerian Dwarf Dairy Goat

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Basic Care

Nigerian Dwarf Dairy Goats, like all other goat breeds need basic care to ensure a good, long, productive and healthy life. Whether you have just 2 pet goats or a large breeding herd, basic good management practices should be a part of your goat ownership. Goats are herd animals and enjoy the company of other goats, so if it is your intention to purchase a goat, be prepared to purchase a minimum of two.

All information written here is with the Nigerian Dwarf Dairy Goat in mind. Where any calculations may be made as to feed, housing or size, it is based on the Nigerian Dwarf Dairy Goat. General management and care can be applied to any goat breed. I am by no means an expert in goat husbandry for there is so much to learn and still more, but my passion is for my goats and in knowing as much as I can to keep them healthy and me sane. I welcome any feedback on this material and also any insights readers have that can be added to help in promoting and keeping the goat industry vital.

I will attempt to address on this webpage, some areas that I feel are needed to help the beginner goatherder and maybe give some insights to the experienced goatherder that they may not have thought about. I am a strong proponent of having a good working relationship with a qualified veterinarian that is knowledgeable of goat medicine. No advice given here or by anyone in the goat husbandry should be taken in lieu of professional advice from a veterinarian when called for. Each goat owner needs to make that decision on their own and feel comfortable with the outcome of decisions they have made.

Having good friends that raise goats and a veterinarian that knows goat medicine are two essential ingredients to good goat husbandry. Neither of which are indispensable in your times of need. Don't wait until your goat is sick and you don't know what to do to try and find a friend or a vet. Start now in cultivating those needed friendships - they are crucial. I have found these friendships in Diane and Gail and with my veterinarian, and I hold them very dear to me. These and other friends have helped me through some difficult times in raising and keeping my goats healthy and productive.

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Barn Maintenance

Let's face it, no one really likes cleaning out those barns, but - Barn Maintenance is as key to the health of your goat as is the feed and health management programs you have established. Without clean housing all your other programs can fall apart and the result could be very unhealthy goats.

General cleaning should be done at a minimum of monthly intervals in warm weather, more often if temperatures are high and goats are using the barn more to stay cool. If your goats are typical of all the other goats in the world, you will notice how they love to come in to the barn to relieve themselves. This is especially true when you have just completed the chore of cleaning out the barn. You fluff up that last flake of straw bedding and in they come to soil "your" nice clean barn. I find the same phenomenon in our cats, when the litter box gets cleaned - in they come to mess up all your hard work.

Barns should be cleaned more often during warm weather to prevent ammonia gas from building up, which may result in pneumonia in goats. Don't be fooled during mild winters that the barn doesn't need cleaning. This has tragically resulted in sick animals. Do the *scent test* - get down on your hands and knees and if you can smell ammonia 8" above barn floor, it's **past** time to clean. Remember, when your goats are resting, their heads are closer to the floor than yours and they breathe in all those harmful fumes.

During winter months, used bedding in barns acts as compost, keeping goats warm against the cold. Winter months may allow for longer periods between cleaning. **IF IN DOUBT ---- CLEAN!!!!** Always make sure there is dry bedding on top to keep your goats dry and away from soiled bedding. We use a product called Sweet PDZ which neutralizes the ammonia in the urine. This helps during cleaning times to aid in eliminating the harmful fumes and is safe to use with goats. We simply shake a liberal dusting layer on top of the existing bedding and then put fresh bedding on top of that. This should **ONLY** be used as temporary measure, as good barn cleaning should **NEVER** be replaced by the "easy-way-out". You only hurt your goats in the long run. We use PDZ as a part of our regular barn maintenance all year long.

Using a pitch fork, fork out all used bedding. The used bedding makes for excellent plant/tree bedding compost and can be placed around plants or tree bases for weed control and fertilizer. Once all bedding is removed, shovel up droppings and dispose of in gardens or in your compost pile.

Use of an inexpensive fly control spray or a diluted mix of Avon Skin-So-Soft in water can be sprayed on barn walls and floor to discourage insects from hanging around or to eliminate them before putting in the new bedding. As time permits, and if you can keep your goats out of the barn for a few hours - let the barn stand and air out before re-filling with bedding.

The following tools should be a part of your barn maintenance to save in hours of work and to help back fatigue. **Shovel** - for scraping and shoveling loose bedding, **Pitch fork** - for removing

used bedding (invaluable in use for livestock), **Broom** - sweep up loose debris or for scrubbing tramped in debris, especially on hard floors, **Mop & Pail** - for use on hard floors to sanitize, **Double rake heads** - purchase 2 inexpensive leaf rakes. Take heads off. Combine together on one pole. This allows for greater surface in raking feces that tend to roll away on you, **Garden fork** - for turning soiled dirt, **Leaf rake** - for raking up all the fine bedding the other tools have left behind.

The following are some maintenance hints on specific floor types. **Cement floors** - scrape off with shovel any embedded manure. Sweep any loose debris you can to acquire a clean surface again. Clean well with plenty of water and soap. A mild low sudsing detergent is an excellent wash. **Dirt Floors** - rake all debris from dirt. If possible turn dirt in the heavily soiled areas to bring up fresh dirt. Dust turned dirt with PDZ or lime (livestock grade) and rake in to freshly turned dirt. **Wood Floors** - scrape off with shovel any embedded manure. Sweep any loose debris you can to acquire a clean surface again. If your wood floors are hard enough to withstand water cleansing, use a mild, low-sudsing detergent periodically to deodorize.

The use of lime (livestock grade) also helps to neutralize the effects of manure on any surface. This should be used liberally before bedding is replaced. Mixed well in turned dirt floors helps to keep the ground from souring. It can also be applied to solid floors to help deodorize. Lime (livestock grade) can also be used in areas of pasture where your goats tend to congregate the most, causing manure to sour. As stated earlier, we prefer Sweet PDZ. This product works the same as Lime (livestock grade). PDZ has an added benefit of sweetening the area and more importantly, actually absorbs the moisture from urine.

Proper bedding for your goats should be taken into consideration to ensure great results from all your hard work cleaning. The use of wood shavings or cedar chips on top of PDZ works well to absorb urine and keep goats dry. Put down a good layer of chips before straw bedding. Straw or inexpensive hay can be used as top bedding. Make sure it is still of good quality, being mold and disease-free. Your goats will see their bedding as food and will nibble or eat it, so care should be taken in what you spread down for bedding. Initial bedding should be at least 10 thick fluffed inches. Goats will tramp this down rather quickly and more bedding should be added as needed to provide sufficient covering of floor. Periodically add bedding to keep area dry for goats to lay in. During cold winter months, this bedding could get quite thick and compact. Clean as gases build up.

Cobb webs. As a note of interest, cobwebs show that your barn is "healthy" and adequately ventilated. Webs can also be used as an emergency bloodstop. So don't be so quick in eliminating all of them from your barn, you may never know when you may need them for a cut.

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Purchasing

Some food for thought when buying your goats. Following is a brief comparison of what separates a reputable breeder from a "backyard" breeder.

A reputable breeder:

- Raises registered breeds - a good breeder that makes the investment in registered goats will generally spend the time and energy needed to breed and sell quality goats.
- Advertises their herd - a good breeder that takes the time to invest in their herd will generally take better care of the herd for selling. Advertising can be the simple ad in their local feed stores to ads in trade journals.
- Always gives their best in breeding towards breed standards - a good breeder who takes the time to evaluate breedings is one who makes sure, to the best of their ability, which breedings will enhance their lines and develop the breed to be the best it can.
- Participates in activities that helps them in evaluating their breeding program - a good breeder who invests time and finances in knowing how their breeding program is working will generally produce a better animal. HES or Linear appraisals, milk test, or breed shows are just a few of the added investments a good breeder will generally participate in.
- Stands behind their goats when sold - a good breeder gives information to buyers on care when selling, has the experience to help their buyers through questions, maintains a good management program, has a dedication and willingness to learn about the breed through - clubs - books - veterinarians - networking, and does all the right things to be a responsible reputable breeder.

A "backyard" breeder: Sells their goats in an "as-is" condition. Has a used car sales mentality. Can't or won't help if problems or questions arise. Is not concerned for improving the breed - has a "Puppy-Mill" breeding program. Does not disbud or vet out their goats. Looks to sell fast and easy.

Be sure when purchasing your goats to ask the breeder if they participate in some of the items listed above that are important to you. Remember, that your goat's health concerns are based on the breeder who sold it to you, the management practices you have set in place, and the veterinarian who now treats your goat when it needs professional medical care.

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Choosing a BUCK

As breeding season comes upon us every year, once again the question arises - do I purchase that buck this year or do I service my does? For the beginner goat breeder the wise answer is to lean on the expertise of knowledgeable breeders and have your does (serviced) bred by another breeder's buck. The reason for this is the expense in purchasing the "BEST" buck for your herd. Good quality bucks that enhance a herd are priced equal to high quality does. It is less expensive to have your does serviced then to buy a buck for a small herd.

Another dilemma that faces new goatherders is the birth of their first buck into their herd that they fall in love with. We fell into this trap and kept a buck from one of our favorite does. He was gorgeous and we just "knew" he was going to be a great buck. Fortunately for us, this buck comes from great lines and has good conformation that compliments other does we have added to our herd. We made wise choices in our base stock to purchase the best we could afford to start with which produced this buck.

As new goat breeders, when we look back on the decision we made to keep him; did we make the right decision? I would honestly have to say probably not - we should have waited until we had more knowledge and experience about raising goats before keeping a buck from our herd of 3 does at that time. As stated above, we were fortunate that this breeding did produce a good herdsire that corrects toplines, front ends and produces great length and dairy character. As a new breeder, you play Russian roulette if you keep a buck from your herd if you don't know the traits or faults in your does well enough. Saving money this way as a new breeder could cost you in the long term. We have since purchased bucks with traits that will continue to improve our line and the Nigerian Dwarf Dairy Goat as a breed.

The knowledge gained as to what is a good buck can only come by time and experience in raising goats. Don't be in a rush to buy a buck, remember a buck is half your herd and purchasing the wrong one can have devastating results years down the road. If this is the year you have decided to purchase that herdsire for breeding, remember that breed improvement should always be the determining factor in your selection. You should know the faults and positive traits in your does prior to your quest for finding that buck. This way you will know what you need to improve or enhance in your does.

Another important factor to bear in mind with the purchase of a buck is his housing. Bucks need to be housed and penned separately from your does so unexpected breedings do not take place. If you milk your goats, leaving the bucks in with your does will also taint the flavor and smell of your milk and cheeses. Make sure housing is taken care of before bringing the buck home. Fencing for bucks need to be 5 feet in height so as to prevent escapes into the doe area. *What to look for in a buck, whether for service or purchase:* determine what qualities in your does you are trying to strengthen or eliminate. Look for these traits in a buck in order to improve your herd by choosing a herdsire that is strong in the points you need for your breeding program. Decide what you want to breed for; a specific conformation attribute, color, size, etc. Look at the bucks dam or daughters, if available, at the breeder to see if the traits he is passing on are desirable for your needs.

Ask for pedigrees to see the lines you are buying into or to see if inbreeding will be a problem. Linebreeding is not a bad thing - remember that inbreeding and/or linebreeding is the quickest way to breed improvement. You need to be knowledgeable with this breeding method, which can only come with time. Always breed back for exceptional points when line or inbreeding, because the counter can happen to bring out weaknesses faster.

Some lines to look for to accentuate the good points: 1. Wide ribbing, 2. Long muscular necks, 3. Deep chest, 4. Dairy character, 5. Coat texture, 6. Wedges in body (head, body capacity - top and side), 7. Smooth blending of shoulders, yet sharp, 8. Straight front legs with wide arching rear legs (not posty), 9. Mammary system on dam or daughters, 10. Straight, close toes. Check testicles to make sure they are pliable and move freely in the scrotum sack. Check the testicles for any odd lumps that are either soft or hard and question the breeder. If their answer is not satisfactory, look for another buck. These are only some of the characteristics you should evaluate in a buck. There are so many others.

Keep your bucks in top condition well before breeding season. They expend a lot of energy even without the actual breeding as they go into a "rut-type" period. With some bucks, they can go "off-feed" during breeding season, so feed them well so as not to lose condition. Do not over breed bucks to does as this can also cause them to lose condition.

Once you've made your choice to either service or purchase a buck, breed your does - then sit and wait those 5 months for kidding season. Pamper yourself and your does during this time and prepare for those sleepless nights when the kids are due.

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Heat Hints

Nigerian Dwarf Dairy Goats go into heat, or experience an estrus cycle approximately every 21 to 28 days. Therefore they can be bred all year round. Most breeders prefer the fall for breeding as Spring allows for the optimum in kidding temperatures. There is no fear of kids freezing in winter cold and no pests such as flies during summer heat to spread disease. This is not to say you can't breed all year, it just means more precautions need to be taken into account.

The heat cycle in Nigerian Dwarf Dairy Goats as in all goat breeds, lasts for 1 to 3 days on average with the doe in a standing heat to accept the buck during that time. The standing heat is a very short duration of the heat cycle (standing heat can be anywhere from 1 hour to 3 days) and the owner needs to be alert as to when this time occurs for breeding to be successful. A standing heat means a doe will stand for a buck and not run from him to be bred. Procreation will not take place generally outside of this time.

Things to look for in a heat cycle:

If you have a buck on premise, most does will spend their heat cycle trying to get to the buck. If a buck is not on premise, use of a buck rag can determine estrus. A buck rag is a piece of fabric that is rubbed over the facial scent glands of any mature buck. It is then placed in an air-tight container. If you think your doe may be in heat, open the container when and place the opened container under the doe's nose to observe her reaction to the buck's scent. If excitement is seen (wagging of tail, becomes alert, talky, etc), the doe is probably in heat and the service of a buck should be rendered quickly.

Some does become very vocal and will voice that they are in heat. Silent heats do occur, careful observation of other heat signs is then needed. A mucus discharge from the vulva which gets into the tail webbing and mats the feathers will sometimes be visible. Mounting (trying to breed other does), courting like a buck to other does, growling, rapid, excited tail wagging when they hear or smell a buck are some other more obvious signs of a doe in heat. Milk production may drop off. Does can also go off feed during this time - make sure this is estrus related and not a sign of another disease condition that can be overlooked and not properly treated. If you observe a combination of these signs, this is the time breeding is most successful. Any or all of these can be evidenced in your doe during heat. There are also those does that won't cooperate at all and not show you even the smallest of signs. Sometimes with these does the best thing to do is put them with the buck for at least a month. The buck will know when she comes into heat and you can get a successful breeding.

False heats can occur. It looks like everything is fine, and then in a week the doe comes back into a real heat. The second heat cycle is generally the true heat and you should breed your doe again. Make sure you mark your calendars and calculate the delivery dates on all breedings so you won't be surprised. If you experience a 5 day false heat in your does, do **not** change the breeding buck (use the same buck you did prior) as you will never be 100% sure who the sire would be. You will never know if the doe was a 145 day, or 150 day, or late, or early on delivery. So, the reputable thing to do is to repeat the breeding so you will know 100%.

It is not recommended to leave does with a buck for extended periods of time as the energy expended on the buck will not keep him in condition for multiple doe breedings. A breeding is extremely short so don't blink or turn away, as you may miss it. After a successful breeding the doe will hunch her back, this is a good sign that the buck has bred her. After breeding, mark your calendar with date, buck name, and doe name. Wait for ~21 days. If doe does not go into heat again, you will join the ranks of the sleepless in 5 months ----- for you now have a pregnant doe to care for and kidding time is soon.

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Gestation Table

The table below is an easy to use gestation calculator based on a 145 day gestation period. Take the day that you bred the doe indicated in column **Month Bred**, subtract the number of days from the column marked **Days**. This will due you the 145 day of the month indicated in column **Month Due**.

Let's go through the math. If you bred a doe on October 15th (**Month Bred**) you would subtract 6 days (**Days**), making her due to freshen on March 9th (**Month Due**).

For a leap year freshening, subtract one more day between October 4th and February 28 for the due date.

Month Bred	Month Due	Days	Leap Year Days
September	February	-8	
October	March	-6	-7 (Starting October 4)
November	April	-6	-7
December	May	-6	-7
January	June	-6	-7
February	July	-5	-6 (Ending February 28)
March	August	-8	
April	September	-8	
May	October	-8	
June	November	-8	
July	December	-8	
August	January	-8	

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Hoof Trimming

Regular hoof trimming, about every 4 - 6 weeks is needed to prevent lameness or infection to the hoof. A correctly trimmed hoof should have the same shape as a kid's hoof. We use hoof trimmers purchased from a goat supply catalog. Utility knives can also be used, but I am too big of a sissy to take my chances with knives.

Ask the breeder you purchased your goat from to show you the proper way to trim a hoof. If the breeder can not do this, find an experienced goat breeder that is willing to help you out. This activity takes a lot of time and experience depending on the size of your herd. Most goats like it as much as we enjoy going to the dentist. Goats will generally fuss while having their hoofs trimmed, bucks are notorious for making the task even more formidable.

Patience and sharp tools help in getting through this every month. The tools need to be in proper condition to trim hoofs. Blunt instruments that won't cut through the hard "leathery" hoof can cause cuts to you or the goat. It is recommended to wear gloves while trimming. Many a hand has been pierced or cut while holding on to a struggling hoof. Rusty instruments should never be used to trim hoofs.

Be sure to have bloodstop on hand when trimming hoofs, as an accidental cut into the quick of the hoof may occur. Clean the wound and place bloodstop on the wound. Apply pressure if needed to make sure bleeding will stop. If a deep wound - clean wound well, pack with powdered bloodstop, bandage and secure the bandage on the hoof. Isolate the goat from the herd to prevent abuse from the other goats. Wait for a few hours until it stops and release goat back into herd after removing bandages. If the wound does not stop bleeding after a prolonged period, call your veterinarian. Make sure you are up to date on your tetanus shots!

After you have completed the major trimming of the hoof, a hoof plane could be used to plane off any bumps or rough edges left by the trimmers. Give your goat a treat for being so good while you trimmed their hoofs.

If hoofs have grown so badly and long that they look like little elf shoes, more care is needed to trim away the excess hoof. Sometimes, depending on the length of hoof, the hoof can become so hardened that normal trimming techniques will not work. Standing the goat on wet straw for an hour prior to trimming will help soften the hoofs for cutting. Use of shrubby pruning shears that are stronger may need to be used. With these goats the assistance of another person to help would be greatly appreciated. If hoofs are grossly overgrown, take caution to remove small quantities of hoof over time (this may take weeks to get the hoof back into shape). Removing large segments at once may cause severe hoof damage, infection, and/or lameness. Remember, it has taken a long time for the hoof to get in bad condition and it takes time to bring it back to normal.

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Shelter

Goats should be housed in clean, damp free shelters, not air-tight buildings; they also need to be well ventilated. A sixteen foot square enclosed area per goat is adequate. Goats need an exercise yard as well measuring at least 250 square feet per goat. They are mountain animals and enjoy obstacles to climb on.

Goats should have sufficient shelter for their size to protect them from the elements. Shade should be provided in summer and protection from winter winds. Remember that goats hate to have rain or snow fall on them. Always provide a way out of bad weather to your goats. These shelters should be bright, airy and clean.

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Worming & Vaccinations

Worming should be done several times a year. Your veterinarian can help in setting up a schedule for your herd.

Annual vaccinations recommended by your veterinarian for your local area should be administered to keep your goat healthy and in top condition.

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Feeding

Most breeders feed a 16% - 18% protein dairy goat feed or dairy ration. Make sure your feed is specific for goats as many other livestock feeds are toxic to goats. The quantity of grain feed is in proportion to the size, age and condition of a particular goat and should be fed accordingly. Hay in the form of a good grass/alfalfa mix or pasture should be available at all times as well as mineral salts and fresh clean water to both does and bucks.

Bucks and wethers should be given special attention with their grain feed intake to help prevent urinary calculi. A feed containing ammonium chloride is recommended as their grain feed source. If this is not available then top dressing their grain with the proper amount of ammonium chloride. Adding vinegar to their water helps in keeping the acid levels in control also.

Goats need plenty of fresh water to keep them healthy. This is especially true of the pregnant and nursing doe. Water is critical to bucks and wethers also for proper maintenance of their urinary tracts.

The following are some seasonal watering tips:

Winter: bringing warm water out to your goats in winter is well worth the effort. They love it and drink more. This is very important for those bucks and wethers that need to consume more water. Milking does need the replenishment of fluids lost in providing that fresh milk we so enjoy. So go ahead and spoil them, they not only need it, but deserve it. Electric stock heaters can be used as well; making sure all wires are protected from goats having access. **Summer:** keeping cool clean water outside all day is essential. Again for bucks, wethers and milking does water intake is needed to keep them healthy and in top shape. Changing water periodically during the day will provide them what is needed. In extreme hot weather conditions, ice or ice packs in buckets is an option if you will be away during long periods of time during a day.

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Insects & Pests

Check regularly to be sure your goats have not picked up any unwanted pests. Spray or dust for lice only if seen. Remove any ticks. Ivermectin ingestible not only works on internal parasites, but external as well. Use of any medication should be cleared through your local veterinarian before administration for dose and safety.

There are many types of fly repellents on the market. I have listed a few here. **Trap-n-toss** - attracts flies, and when full you just throw away. **Fly strips** - hang from above, when filled with flies remove and throw away. Be careful when handling, these strips are very tacky. A must for all barns. Make sure strips are away from where goats can grab and ingest. **Fly bottles** - hang around barn area. These may come with a solution that attracts flies. If it does not come with an attractant, canned cat food mixed with enough water to cover works great. As this becomes full - empty, clean and re-start. This is a bit messier than the other options, but less costly. **1% pyrethrum** - hose spray. To be used directly on goats to repel flies on animals. Make sure spray does not get onto face of goats. Use towel to gently cover head area. **Diatomaceous Earth (DE)** - a 100% natural insecticide made from organic materials. We have just started using DE this year and have found it to be a long-lasting treatment for insects. It can be dusted or diluted in water and sprayed in the area. I do not use it on my goats as either a dust or give it internally for parasites. It is supposed to be safe for them, but I use the paste de-wormers at this time.

Repellents and insecticides are a help in maintaining the amount of insects and pests that will hassle your herd, but again it gets down to your overall management practices as well. If you are not cleaning the areas where you house or pasture your goats, you will have more insect/pest concerns than you want. As my brother always says, "minimum, effort - maximum enjoyment" - if you take care in maintaining a clean, healthy environment you will have less to worry about in the long term.

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Milking

Supplies:

Item	Use	Comments
pail	To collect milk	plastic as this retains milk smell
Milk filters	consumption	but use new filter each time.
Funnel	containers	materials can be substituted.
Clorox bleach	from supply house.	next use
Ice Water	To chill milk rapidly	you milk your does.
Pasturizer	To pasturize milk	clean and disease-free.
Milk stand	milking	milking and cleanliness
Teat Tape	Stops leaks	kids from nursing.
Scale	To weigh milk	necessary.
DHIR Dipper	pail for test	Helps in getting a sample of milk for butterfat content.

Why Milk??

Milking Advantages:

You know how much milk each kid is consuming.

Udder infections can be checked and corrected promptly.

Prevents some milk diseases from spreading to kids.

Milk is used for cheesemaking and other recipes containing milk and it just tastes great!.

Milking goats is a good stress reliever from our hectic daily schedules.

If goats are shown, it keeps does accustomed to being milked on show days.

Bottle fed kids are calmed down and bond to their goatherder if sufficient time is not invested with dam raised kids.

Milking Disadvantages:

It is a commitment to milk every day twice a day.

It adds time to chore time.

Milk Test Advantages:

You know how much milk each doe is producing.

You know your herd management practices are good compared to the rest of the country.

Brings higher market value to your goats - differentiates your herd from the rest.

Milk Test Disadvantages:

It is a commitment to milk 305 days a year, twice a day.

Milk Test Pointers:

There are three forms of milk testing:

1. Circle - this involves a minimum of three herds having a minimum of two goats in each herd. Each participating herd completes testing on each other's once a month. Each herd owner must complete a training session by an approved instructor. Costs associated are economical.
2. Supervised - this is done on an individual herd basis. A certified tester comes to your farm and completes testing on all registered does. The schedule is set by tester and is usually a random call once a month. Supervisors are re-licensed annually. There are higher fees attached to supervised tests than circle tests.
3. One-Day Test - this entails finding an AGS tester in your area. The tester will come to your farm three times in a 24-hr period to see you milk out your does and test. They use a formula to project what the doe is capable of milking should she have been on 305-day cycle. Cost of a one-day test are for the supervisor fee and mileage (3 times to farm) plus any other added expenses. Costs are most economical, but may not give true milking capability on herd.

For Nigerian Dwarfs, write or call AGS or NDGA for application to get on milk test. This should be done before your does freshen so you get the full 305 day test program. Applications are accepted by AGS all year round. DRPC (Dairy Record Processing Center) is an organization dedicated to the maintaining of all dairy records on your individual goats having to do with milk test. They also maintain such stats as names, breeding, height, weight, freshening stats, etc. This organization sends results back from your milk test.

Milking Hints:

A happy doe produces better for you. Make sure you are maintaining proper management over your herd to keep them healthy and happy.* Goats should always be milked in as sterile an environment as possible to prevent udder disease and contamination of milk. Their stalls are not a good idea. A separate area, room or building is the ideal. Always keep this area clean to ensure a good milk product. * It is optional to feed goats grain at milking time. This can calm them to stand for the milking exercise.* If your doe kicks; secure rear legs to milk stand while milking by tying them to the back of the milk stand. DO NOT tie so tight as to hurt or damage the doe's legs. Eventually she will learn to stand and enjoy being milked. * Milk your does two times a day at approximately 12-hour gaps. An hour +/- will not bother the doe, but try to keep her schedule as consistent as possible. * Keeping does separated a good distance from the bucks will prevent any "bucky" taste getting into the milk. A doe's environment influences how the milk will smell and taste. * Feed good quality sweet alfalfa/grass hay to any lactating doe. * A good sweet grain of at least 16% protein will help produce a more abundant sweet milk. What your does eat ends up in their milk production.

If you choose to dam raise your kids, it is still feasible to milk successfully by separating the kids from the dam at night (around 8 o'clock). This can be done by placing them in crates in the stalls with their dams so they are still bonded and nurtured by their dams. Milk does in the morning and replace kids back with them. Kids won't need to be bottle-fed. Remember that goats are flexible. No damage will occur to the udder if your schedule should lapse every once in a while. Just don't make a habit of an inconsistent schedule. Even if you miss one milking, it won't hurt except to maybe lower production for a short period. HAPPY MILKING!!!

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Pregnancy and Kidding Supplies

Item	Use
Wireless intercom	Saves time running back and forth to barn Leave sound - ON at all times
Hot pot/mug	hand
Flashlight	process when the doe is away from light source.
Breeding Calendar	Mark service and freshening dates 145 - 150 day Gestation
index cards	and #s, shots needed at birth
Pad/notecrds	problems or things to watch for in the next freshening - one card per doe
Oocytotoxin	prescription medication.
Molasses in water	After freshening for energy boost. Use warm water during cold season
Towels	Drying off kids. At least one clean towel per kid.
Calf velcro leg bands	Nigerians, these can be cut lengthwise and used as loose fitting collars
Iodine	over to drench well. Use baby bottle, teat dipper, or any small container.
Goat Nutra Drench	Multi-vitamin for weak kids or stressed doe. Dose as directed.
Garbage bags	For dirty towels and in case of the unfortunate death of newborn.
Stethoscope	To examine internal functions if needed
puller	(see Caprine Supply Catalog under milking Equipment)
Bottles/nipples	For bottle feeding When doe can't or prefer to bottle-feed kids
(natural/instant)	To bottle feed kids for first 3 days When doe can't or prefer to bottle-feed kids
Uterine boluses	Inserted into uterus after DIFFICULT birth Put in immediately after freshening
Teat tape	Stop leaky teats, kids or does from suckling. Apply before freshening
Surgical gloves	Must be used when entering doe during difficult birth
KY jelly	difficult birth
Dental floss	not enter kid
Surgical scissors	1 inch from the first, cot the cord BETWEEN the 2 tied areas
Weak kid syringe	is used at birth
Nasal aspirator	under nose with a piece of straw to get kid to sneeze first.
Weigh tape	Weigh kids at birth. Put tape around heart girth for weight
Rectal Thermometer	To take temps if needed. Average goat temp 102-104

Keto stix or powder	supplement suagr or molasses in water
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Transporting

Goats should always be transported in such a way to ensure their safety and well being. For short trips like to the Vet, neighborhood functions, friends ..., use of Vari-Kennels for dogs in your car or truck with ample bedding of straw will be sufficient. Wire cages can be used but place protective coverings on seats to prevent staining from urine or feces. Protective covers also shield them from the wind. Ample ventilation is needed at all times. Do not transport in open air vehicles as this can stress the goats and could cause respiratory problems. Tie goats, if needed with 1-foot long leads

If you are planning a long trip such as Shows, purchasing, moving... Follow the basic instructions as above, giving extra care to more bedding and the stability of your goats for a long drive. On longer drives, devise a way to have access to food and water through the use of portable hayracks and deep water containers (filled slightly) that won't allow for spillage.

If you are shipping by Air Freight, make sure you have an official air crate. You can call your carrier to get this information. Place goat in acceptable airfreight crate with ample bedding. A Vari-kennel, number 300, can hold up to 3 Nigerian Dwarf Dairy Goat kids comfortably, or 1 small adult. The size of a container should be large enough to allow for a full-sized goat to lie down and turn around easily. A water bowl should be attached for attendants to provide water if needed for delays and hay in bottom for eating.

Contact air carrier prior to ship date to get the needed information for shipment and costs. Inquire if you pay upfront or if they will accept COD. Get the name of the contact person at airlines. Bring photo ID with you to the airport to identify yourself. Be at airport 1 - 2 hours before departure time. If goat's destination will put it in at night, make sure you check with airline if receiving airport's kennel will be open, if not, **DO NOT SHIP!**

Inform buyer to pick up goat at counter-to-counter area. This is a better service for your goats as opposed to cargo shipment. It costs a bit more, but for the comfort of your goat and ease of pick-up, it is better. Airlines are used to shipping puppies that need to be 2 months old and put that stipulation on all critters, even your goats.

Health certificates are needed from your veterinarian can be no more than 30 days old at time of shipping. If your herd IS certified TB and Brucellosis free, then kids do not need testing. If your herd is NOT certified TB and Brucellosis free, then kids and adults have to be tested. Weather is another factor to be taken into consideration when shipping. You can not ship if outside temps fall below 45 degrees or rise above 85 degrees. If shipping during winter months have Veterinarian certify on papers that goats can withstand temperatures under 45 degrees for 45 minutes. Always check weather report day of shipping.

Inter-state shipping: call your 800# to determine state by state requirements for tests and shipping: (800) 545-8732.

For Canada, Brucelosis, TB and blue tongue tests are required for kids 6 months and older.

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Show Supplies

Item	Use	Comments
Electric clippers	To remove hair	opposite direction of hair growth.
lubricant	To lubricate clippers	Use periodically during clipping to lubricate blades
Lamp oil	cool.	Dip blades in oil while clipping to keep clippers cool
Hoof trimmers	To trim hoofs	Use gloves to prevent injury of hands during use.
Hoof plane	trimming	After trimming plane hoof to get correct shape
Brushes	loose dirt	after clipping
Sissors	To clip tails	Clip tail tip to create a brush look at the end
Shampoo	clipping	if needed to remove dirt and stains
Show sheen	coat	coat. Use a mild horse or cow spray.
Milk Stand	when milking	showing
Collars/leashes	ring	collars

Reminders to take to the show:

- * Hay
- * Grain
- * Straw or bedding if not supplied
- * Grain and Hay feeders
- * Water buckets
- * Bottles and nipples (if your bottle feeding kids)
- * Salt or trace minerals
- * Tie ropes
- * Towels
- * Brushes
- * Hoof trimmers
- * Milk stand/pail
- * Udder wash
- * Teat dip
- * Clippers
- * Paper towels
- * First aid items (anibiotics, flyspray, disenfectants, bloodstop, bandages)
- * Herd signs for above pen
- * Scissors

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Table of Normal Values

Rectal Temperature 102.5 - 104 F

Pulse 60 - 80 per minute

Respiration 15 - 30 per minute

Puberty 2 - 12 months

Estrus cycle 18 - 23 days

Estrum 12 - 36 hours

Gestation 145 - 150 days

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CAE Q&A

The following is a compilation of information gathered on CAE from questions submitted to a research veterinarian at Washington State University, by ENDGE members in 1999. The questions are grouped by breeders who took the time to think about what they wanted to know from a breeder's point of view with answers from the Research Veteranarian.

I have omitted his name on purpose to keep his life sane at the University. If anyone is interested in contacting him on this subject, feel free to email us and I will forward the question on to him and reply back to you.

Breeder #1: Had herd (pre-1993) of about 20 Saanens -older does tested positive but only two does with clinical symptoms. Kids were pasteurized and kept separate from herd until they freshened. Most remained negative for the three years I had them. So I believed the data back then that there was very little horizontal transmission.

The Following are comments from the WSU veterinarian on later submitted questions.

You raise some good questions. Initially, I was pro-test, and did not consider other factors. Over the past few years I have begun to think like a goat owner and ask why are we testing? What are the costs, and consequences of testing? What are the costs and consequences of having a CAE positive animal(s) in the herd?

I think all these questions need to be answered by the goat owners themselves after they know the facts. So that is where I come in. I have inserted my comments into your text. If nothing else, ask your members the above questions.

THE MORE INFO AVAILABLE TO MAKE AN INFORMED DECISION THE BETTER FOR THE INDUSTRY. BEST, Dr X.

Q1. What would be the big deal if all breeder's decided not to do anything about CAE or it's prevention?

A1. BREEDER'S HAVE A RESPONSIBILITY TO RAISE AND SELL GOOD PRODUCTS. CAE INFECTION CAN LEAD TO 10% ILLNESS 3-4 YRS POST-INFECTION. IF I WERE STARTING A GOAT HERD, I WOULD CHECK FOR JOHNE'S, CL, CAE, BRUCELLOSIS, AND TOXOPLASMOSIS. IN ESTABLISHED HERDS, I WOULD PINPOINT CERTAIN INFECTIONS THAT I WANTED OUT OVER NEXT 5 YRS, AND SET ASIDE \$ TO DO IT ALONG WITH SCREENING FOR ABOVE ON MY HERD REPLACEMENTS.

Q2. I still don't understand, after all I've read, heard, or have witnessed of the disease that it is such a terrible thing. To spend the time and money it takes to control it, when it just seems inevitable the majority of goats will test positive for antibodies even under the strictest of care seems futile.

A2. BY TESTING REPLACEMENTS, RESIDENT HERD GOATS ON AN ANNUAL BASIS, AND DOES PRIOR TO KIDDING, CAE INFECTION CAN BE SUCCESSFULLY CONTROLLED AND ELIMINATED IF THAT IS THE DESIRED GOAL. THE COSTS WOULD BE HIRER, BUT THE CONSEQUENCES (INCREASED SALE, MARKETING, EXPORT, BREEDING,ETC.) WOULD BE WORTH IT.

Q3. When 80% of goats tested are positive, it seems arrogant of breeders to feel their herd will remain such.

A3. THE ONLY WAY THIS WOULD WORK WOULD BE IF ALL GOAT OWNERS IN THE REGION, CLUB, GROUP, ETC. WERE ON THE SAME PAGE AND MADE THE DECISION THAT ERADICATION WAS A GOAL OVER NEXT 5-7 YRS, AND THAT IT WOULD ADD SOMETHING TO THE OVERALL WORTH OF THE ANIMALS.

Q4. My herd is still negative at this time and I don't know what my recourse will be if/when they go positive. Understanding the true (unhyped) outcome of non-prevention will help me. I understand the financial aspect that folks may not purchase, but other than that - what is all the hysteria about?

A4. EARLY ON THIS MAY HAVE BEEN A TREND."MY GOAT IS BETTER THAN YOUR GOAT BECAUSE IT IS CAE NEGATIVE". NOW THERE IS ENOUGH INFO OUT ON THE INTERNET, GOAT JOURNALS,ETC. THAT ONE NEEDS TO DECIDE IS THIS WORTH IT FOR ME TO GO THROUGH THE TROUBLE OF TESTING? WHAT DO I GAIN FROM DOING IT IF EVERYONE ELSE IS IGNORING IT? THERE HAS TO BE SOME ECONOMIC INCENTIVES TO TEST AND MAINTAIN A CAE NEGATIVE HERD. IF THERE IS NOT, THAN ONE MUST RECONSIDER WHY THEY ARE TESTING IN THE FIRST PLACE.

Q5. Is it that CAE has taken a on life of its own with breeders or am I still missing the health risk and significance of this disease?

A5. WE KNOW WHAT THE HEALTH RISKS ARE (10%), WE KNOW HOW IT IS SPREAD (BLOOD/COLOSTRUM), AND WE KNOW HOW TO TEST FOR IT (SERUM ANTIBODY). SINCE IT IS A VOLUNTARY CONTROL PROGRAM, ONE SHOULD DETERMINE IF THEY WANT A GOAT NEG, A PARTIAL HERD NEG, AN ENTIRE HERD NEG, OR AN ENTIRE GOAT CLUB-COMMUNITY NEG (LIKE A DAIRY CO-OP).

Q6. I get frustrated in my mind because I don't see a solid connection between the disease and the super-hyped reaction of people towards it. Again the example of rabies - THIS I understand with all the implications, or even Johnnes, TB and BRU, or other highly contagious deadly, disabling diseases, but CAE seems like a stubbed toe compared to these that I can't grasp.

A6. A STUBBED TOE IS RELATIVE COMPARED TO OTHER INFECTIONS THAT MAY LEAD TO DISEASE. I THINK YOUR GROUP SHOULD SET UP GUIDELINES FOR THOSE MEMBERS WHO WANT TO GO CAE-FREE, BUT NOT DICTATE THAT IT IS MANDATORY. I COMMEND YOU ON SETTING THE DISCUSSION UP. IT HAS BEEN GOOD FOR ME TO VERBALIZE THE COST/CONSEQUENCES POINT OF VIEW.

The following information is from a presentation Dr. X gave on CAE.

TITLE SLIDE:

The CAE and HIV Controversy:
Facts vs. Fiction

SLIDE #1:

Washington State Goat Conference November 20, 1999

SLIDE #2:

Brief Overview Of CAE Virus

- CAE is an infection of goats worldwide
- The percent of infection Varies from country to country with the UK reporting infection rates as low as 2% and the US as high as 83%
- Since 1983, many goat owners have been regularly testing for CAE infection by testing serum for CAE antibodies
- Failure to maintain control measures may lead to increased occurrence of infection

SLIDE #3:

Infection Versus Disease: What's the Difference?

- It is very important to recognize that goats may remain symptomless carriers of CAE. It is estimated that 10% or less of infected goats will develop Clinical symptoms
- The carriers appear normal and their production (meat, milk, fiber, Endurance, etc.) is not effected

SLIDE #4:

Infection Versus CAE Disease: Five Clinical Forms

- * Asymptomstic, no clinical signs
- * Arthritis - yearlings & adults Infection
- * Hard udder Disease
- * Pneumonia
- * Encephalitis
- * Progressive weight loss

SLIDE #5:

CAE Transmission: How The Virus Is Spread

1. Through the colostrum or milk of infected does. The practice of feeding milk pooled from several does will facilitate spread of infection throughout the kid population
2. By transfer of blood from an infected to a non-infected goat, e.g. by tattooing or multiple use of needles

3. By direct contact between goats, although prolonged contact is probably necessary, by virus shed in body fluids such as saliva, urogenital secretions, feces, and/or respiratory tract secretions
4. In-utero transmission probably does not occur, or is at a very low level (not documented yet)
5. The virus is very stable in the environment and transmission via pasture or buildings, etc., will not occur (the virus is inside blood cells)
6. Direct cross species transmission between sheep and goats has been demonstrated; lambs fed milk from CAE-positive goats become infected with the virus, and sheep inoculated with CAE become infected and develop lesions of the disease
7. Goats infected with CAE remain carriers for life and many symptomless carriers exist in the population. The virus can thus be unwittingly spread throughout the flock or herd, particularly to the young stock, without the owner being aware of a carrier being present

SLIDE #6:

Diagnostic Strategies

- * Asymptomatic, no clinical signs, detect serum antibody to CAE
- * Clinical signs Infection Disease
- * Postmortem lesions
- * Serum antibody to CAE

SLIDE #7:

Treatment Of CAE

- There is no treatment at present for CAE
- There is no vaccine at present for CAE control
- May use non-steroid anti-inflammatory drugs to relieve the pain of arthritis. *Consult with your veterinarian*

SLIDE #8:

What Are The Consequences Of CAE Infection?

The answer(s) to this question are very important since it provides justification for extra work and money involved in testing goats and segregating and/or culling CAE positive goats

SLIDE #9:

Possible Consequences of CAE Positive Goats

- No sale
- Early cull (due to disease)
- Shedding of CAE to susceptibles in the herd
- Segregation/euthanasia
- Not suitable for breeding (fiction)
- Public health risk (fiction)

SLIDE #10:

CAE Prevention And Control

1. Routine tests at 6- to 12- monthly intervals for a minimum of 2 years and preferably more, with no evidence of infection in the herd during that time, are required before a herd can be said to be "CAE virus free"
2. No kid should receive unpasteurized goats' milk or colostrum from any animal except its dam. Pooled milk should never be fed to kids. If a doe subsequently proves to be a virus carrier only her own kids will have been infected
3. All adult goats (or in the case of a kid, its dam) should be blood tested before entry in to the herd
4. Cull or isolate all positive goats
5. Isolate the offspring of all CAE positive goats until sure they are CAE negative
6. Infected goats should be separated from non-infected goats by at least a fence. Separate feeding/water utensils should be used
7. Milk infected goats last; keep milk separate from non-infected milk used for feeding kids
8. As the virus is sensitive in the environment, infected goats can graze the same pastures as non-infected goats provided the groups are kept separate, i.e., graze non-infected goats in the morning and infected goats in the afternoon
9. Because the incidence of uterine infection by the virus is very low, removing the kids at birth from reactors by "snatching", i.e., preventing suckling or licking by dam, enables a non-infected kid to be produced in the vast majority of cases
10. Batch-mate and induce parturition using prostaglandins or delay parturition. Consult with your veterinarian
11. Isolate kids, house separately from infected goats, and rear on cow's colostrum and milk or calf or kid milk replacer. If goats' milk or colostrum is fed, it should be pasteurized even if it comes from a supposedly sero-negative doe. Milk can be pasteurized by heating for 1 hour at 56 degrees C
12. Blood sample kids shortly after birth to detect any possible passive transfer of antibody if the snatching was not done efficiently, then at 6 months and 3 month intervals thereafter to detect possible virus carriers

NOTE: The pasteurized rearing method, coupled with a comprehensive testing and Segregation program is the cornerstone of CAE prevention and control. Rowe & East, 1997

SLIDE #11: What Makes CAE Virus So Unique Amongst Goat Infections?

- Retroviral infection
- Once infected, infected for life
- Potential of shedding to non-infected herd mates
- Potential for clinical disease (~10%)
- There is no cross-reaction with some HIV tests

SLIDE #12:

What Is The Connection Between CAE And HIV?

- Both are lentiviruses (slow, chronic infections)
- Both are very cell-associated (blood cells)
- Both are not highly contagious
- Both have problems with cross-reactivity in testing
- Humans developing antibodies to CAE may cross-react with HIV assays

SLIDE #13:

False Positive Results

When there are two closely related viruses, they share look-alike proteins referred to as antigens. The "look-alike" antigens stimulate "look-alike" antibodies resulting in false positive results

SLIDE #14:

Who Is Doing The CAE/HIV Research?

University of Southern California, Los Angeles

SLIDE #15:

Highlights Of USC, LA

- Humans have been reported to be HIV antibody positive after drinking raw goats' milk
- The reason for this is now considered to be due to CAE virus in the raw goats' milk
- Normal volunteers (n=16), 63% positive for CAE, 25% positive for HIV, 40% positive for both
- Known HIV volunteers (n=10), 10% positive for CAE, 100% positive for HIV, 10% positive for both

SLIDE #16:

What Does All This Mean?

- Nothing, just two cross-reacting viruses
- Potentially significant if CAE virus can protect humans against HIV infection and disease
- No evidence that CAE can cause disease in humans (not a public health threat)
- Keep up to date with latest research efforts
- Always talk to persons who know what's going on to dispel any rumors or myths

SLIDE #17:

Acknowledgements

Special thanks to Dr G X for helping with this presentation.

I especially thank Dr. D X and Dr. P X for their insights into the CAE virus pathology. I appreciate the excellent work of the Biomedical Communications Unit for help with this Presentation. Control of CAE Virus Takes Work & Periodic Testing

By X* Control of on-the-farm spread of CAE virus takes a concerted plan, which involves lots of work and periodic testing. Remember that CAE virus control is a voluntary management decision and that one should look at what they are trying to achieve. If one is trying to attain CAE free status, then it requires more frequent testing and testing pre-purchase replacements. Part of CAE virus control is knowing where the virus is when not causing any disease. The virus replicates and becomes persistent in blood cells (macrophages).

Knowing this enables us to stop this form of spread. It can be accomplished by heat treatment of colostrum, and thoroughly rinsing animal equipment in warm soap and water. The water serves as a valuable disinfectant by causing the macrophage to burst, thereby destroying the cell and rendering CAE virus inactive. The virus does not remain infectious outside the goat's body and is dependent upon fresh blood for post-colostral spread.

Testing for CAE virus involves looking for antibodies to the virus. This is an indirect method for detection of infection, but is generally very reliable and inexpensive. The sensitivity (true positives) for serologic assays approaches 98% and the specificity (true negatives) is 99%. By serologic standards this is a very good assay. Check with your lab to see what test they run and what the sensitivity and specificity are. It makes a big difference in your control program. When sensitivity falters, false negative results are observed.

There are four main reasons when this may happen. While sensitivity can be somewhat overcome by more frequent testing, the same cannot be said for specificity. A non-specific assay detects false positives and this can be disastrous to a control program. There are three main reasons for false positive results. Contact your veterinarian or diagnostic laboratory for further information on testing strategies to use to control CAE virus infections.

Acknowledgements: Special thanks to Dr. D X for insights on CAE virus testing. Appreciation to J X for working with the CAE virus antibody assays and offering advice on assay details. My thanks to the numerous goat owners who offer constructive advice on CAE control programs used on their farms.

*College of Veterinary Medicine Washington State University Pullman, WA 99164-6610 X JF, Washington State University, 1999 J; \\X\1999\CAE NEWSLETTER References: Knowles DP. Laboratory diagnostics tests for retrovirus infections of small ruminants. Vet Clin No Amer 13:1-11, 1997, Rowe JD, East NE. Risk factors for transmission and methods for control of caprine arthritis encephalitis virus infections. Vet Clin No Amer 13:35-53, 1997. X JE. Caprine arthritis encephalitis: Controversies surrounding control and different Laboratory tests. Presentation: Alberta, Canada Goat Breeders Assoc., May 1999.

Glossary of terms used:

- CAE virus - A retrovirus belonging to the lentivirus (slow) subfamily. Causes variable disease in goats. Generally regarded as a life-long infection
- Macrophage - A form of blood cell important in the body's defense against microbial infections
- Sensitivity of Assay - The ability of the lab test to detect true positive infected animals
- Specificity of Assay - The ability of the lab to distinguish true negative (not infected) animals
- Seroconvert/seroconversion - The process the immune response goes through between infection and detection of antibodies. Ranges between 1 - 4 weeks
- Delayed seroconversion - seroconversion delayed for months following infection. The reason for this being investigated
- Seropositive - Antibody-positive animal tests positive in serology assay
- Seronegative - antibody-negative animal tests negative in the serology assay
- Blood-borne - The act of spreading an agent by blood to another animal
- Passive antibody - The antibody made in one animal and given to another animal. Provides short-term protection (3 weeks - 3 months) to some infections
- Active antibody - The antibody made in the animal to an infection. Provides long-term protection to some infections

J:\X\1999\CAE NEWSLETTER

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How to read Milk test records:

An example. 3.11-305-857-57(6.8%)-26(4.5%)20 3/4"

This means that the doe started her lactation at the age of 3 years and eleven months. In 305 days she milked 857 pounds of milk, 57 lbs of butterfat averaging 6.8%, and 26 lbs of protein averaging 4.5%. For Nigerians there is an additional requirement showing the height of the animal at the end.

So let's go through this again:

3.11 = Age of doe when she started lactating (fresh date): This doe was 3 years and 11 months old when she freshened for the start date of this milk test lactation.

305 = Duration on milk test in days for this record. This lets you know how many days this doe was on test for this record. This doe's record was calculated on her 305th day of milk test.

857 = Total pounds of milk produced for this record. This doe produced 857 pounds of milk in this 305 day lactation period.

57(6.8%) = The number of pounds and percent of butterfat produced for the period of this record. This doe produced 57 pounds of butterfat equivalent to 6.8% of total volume of milk in this 305 day lactation.

26(4.5%) = The number of pounds and percent of protein produced for the period of this record. This doe produced 26 pounds of protein equivalent to 4.5% of total volume of milk in this 305 day lactation.

20 3/4" = Height of a doe at the start of her milk test lactation. This doe was 20 and 3/4 inches. height is taken only once and at the start of a milk test lactation period.

<u>AGE</u>	<u>MILK (STD)</u>	<u>MILK (MINI)</u>	<u>BUTTERFAT (STD)</u>	<u>BUTTERFAT (MINI)</u>
2-00<	1500	500	52.50	25.00
2-01	1506	502	52.71	25.10
2-02	1512	504	52.92	25.20
2-03	1518	506	53.13	25.30
2-04	1524	508	53.34	25.40
2-05	1530	510	53.55	25.50
2-06	1536	512	53.76	25.60
2-07	1542	514	53.97	25.70
2-08	1548	516	54.18	25.80
2-09	1554	518	54.39	25.90
2-10	1560	520	54.60	26.00
2-11	1566	522	54.81	26.10
3-00	1572	524	55.02	26.20
3-01	1578	526	55.23	26.30
3-02	1584	528	55.44	26.40
3-03	1590	530	55.65	26.50
3-04	1596	532	55.86	26.60
3-05	1602	534	56.07	26.70
3-06	1608	536	56.28	26.80
3-07	1614	538	56.49	26.90
3-08	1620	540	56.70	27.00
3-09	1626	542	56.91	27.10
3-10	1632	544	57.12	27.20
3-11	1638	546	57.33	27.30
4-00	1644	548	57.54	27.40
4-01	1650	550	57.75	27.50
4-02	1656	552	57.96	27.60
4-03	1662	554	58.17	27.70
4-04	1668	556	58.38	27.80
4-05	1674	558	58.59	27.90
4-06	1680	560	58.80	28.00
4-07	1686	562	59.01	28.10
4-08	1692	564	59.22	28.20
4-09	1698	566	59.43	28.30
4-10	1704	568	59.64	28.40
4-11	1710	570	59.85	28.50
5-00>	1719	572	60.17	28.60

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