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GEORGIA DAIRYFAX

http://www.ces.uga.edu/Agriculture/asdsvm/Dairyscience/dairypage.HTML *November/December 2002*

Dear Dairymen:

The enclosed information was prepared by the University of Georgia Animal and Dairy Science faculty responsible for Extension Programs in Dairy Science. We trust this information will be helpful to dairy farmers and dairy related businesses for continued improvement of the Georgia Dairy Industry.

The following information is included:

Sincerely,

_____
James W. Smith
Extension Dairy Scientist

_____
County Extension Director or County Agent

/jlo

A New Year

Lane O. Ely
Extension Dairy Science

Every year we make New Year resolutions and wishes. Most of these are doomed for failure as we do not realistically look at the situation or really make the effort to make changes. Classic examples would be my annual resolution to grow hair and be in tip-top shape. Needless to say one is unrealistic and the other involves much too much time and dedication. We often wish for those things that are unrealistic or obtained only through hard work. In the dairy industry, we often wish for continuous, record high milk prices and do not concentrate on controlling our costs. Controlling costs can give us long term flexibility to enable us to weather the cycle of high and low milk prices that occur.

New Year's Day is also an opportunity to look backwards as well and to evaluate how we have done over the year. What changes were made, how did they work? Good records are the key to make your review successful. In the Dairy Business Analysis Program, inventories of cattle, feed, supplies and assets are taken. This inventory is year end for the past year and the beginning inventory for the next year. Even if one is not part of the Dairy Business Analysis Program it is a good idea to record your inventories. Over time they will allow one to track progress and measure the effect of changes.

Take a few moments and make your New Year's Resolutions. Try to remember them next year and then evaluate how things went. Good luck.

The Georgia Dairy Industry Numbers

Lane O. Ely

The Georgia dairy industry has continually been changing over the years. Many people interpret changes as an indication that the Georgia dairy industry is not viable as an agricultural enterprise because the number of farms have been declining. Is this the whole picture?

Table 1 lists the number of dairy farms, number of cows, milk produced and milk per cow for the years 1945, 1965, 1985 and 2000 in Georgia. The number of farms has dramatically decreased from 6040 in 1945 to 386 in 2000. One could conclude that if this trend continues, the conclusion would be that the dairy industry is going to disappear in Georgia. Cow numbers have also declined but at a slower rate than farm numbers. There were 360,000 dairy cows in 1945 and in 2000 there were 87,000 cows in Georgia. Again one would conclude that the dairy industry was disappearing.

When one looks at milk produced, the trend is different. In 1945, 1.134 billion pounds of milk was produced and in 2000, 1.430 billion pounds of milk was produced. This is a different trend as the total amount of milk produced has actually increased. This is the result of increased milk production per cow which has risen from 3,150 pounds per cow in 1945 to 16,436 pounds per cow in the year 2000. This increase per cow has been due to better genetics, better management, improved facilities to combat heat stress and better feeding including the introduction of silage. Today there may be fewer dairies but they are producing milk at near record levels.

What is the future for the Georgia industry? Because of an increasing population in the Southeast there is increasing demand for milk (Table 2). In the Southeast today that demand is primarily for fluid milk with the region importing many products such as cheese. For overall milk demand, the Southeast is a deficient region. With the increasing population, there has been a decline in milk production in the Southeast of -17.24 (Table 3). The exceptions have been Georgia and Florida.

The Georgia dairy industry has changed since 1945 but it is still a viable agriculture industry today that has a

positive future. The Georgia dairy industry can grow as the demand for milk in the Southeast continues to increase.

Table 1. The Georgia Dairy Industry

Year	Dairies	Cows	Milk	Milk/Cow
			billion pounds	pounds
1945	6040	360,000	1.134	3,150
1965	2586	157,000	.991	6,300
1985	868	118,000	1.302	11,128
2000	386	87,000	1.4303	16,436

Source: Ag Statistics, Georgia Department of Agriculture, Federal Marketing Service

Table 2. Population Change for 1970 to 2000

	1970	2000	% Change
AL	3,444,354	4,447,100	29.11
AR	1,923,322	2,673,400	39.00
FL	6,791,418	15,982,378	135.33
GA	4,587,930	8,186,453	78.43
KY	3,220,711	4,041,769	25.49
LA	3,644,637	4,468,976	22.62
MS	2,216,994	2,844,658	28.31
NC	5,084,411	8,049,313	58.31
SC	2,590,713	4,012,012	54.86
TN	3,926,018	5,689,283	44.91
VA	4,651,448	7,076,515	52.18
Total	42,081,956	67,471,857	60.03
U.S.	203,302,301	281,421,906	38.43

Source: U.S. Census

Table 3. Milk Production from 1980 to 2000

Million Pounds

State	1980	2000	% Change
AL	600	348	-42.00
AR	745	524	-29.66
FL	2028	2461	21.35
GA	1367	1433	4.83
KY	2219	1690	-23.84
LA	1003	705	-29.71
MS	817	544	-33.41
NC	1631	1189	-27.10
SC	537	369	-31.28
TN	2241	1405	-37.30
VA	1999	1901	-4.90
Total	15,187	12,569	-17.24
U.S.	128,425	167,658	30.55

Source: NMPF - 2002 Highlights

Pasteurizing Milk to Feed Calves

John K. Bernard
Dairy Nutrition and Management

According to a recent national animal health survey, more than 30% of dairy producers feed whole milk to calves. Whole milk is a good source of nutrients and most dairies have milk that is not suitable for sale which can be fed to calves. As mentioned in a previous article, there are potential problems with feeding whole milk including the spread of disease (Johne's, BVD, BLV, etc.), increased exposure to mastitis causing bacteria, and antibiotic residues.

Pasteurization has been shown to improve growth rates and reduce the number of days calves were affected with diarrhea or pneumonia when properly done. Many producers have successfully used pasteurization to maintain milk quality and improve animal performance. The two most common problems observed with pasteurization are day-to-day consistency in pasteurizing procedures and general sanitation. Producers should have a written standard operating procedure (SOP) for pasteurization and cleaning routine that has been explained to all employees to avoid these problems. Employees need to understand the importance of following the SOP and the potential problems associated with any shortcuts in the SOP on animal health and mortality losses.

There are two main methods of pasteurization, batch pasteurization or flash pasteurization. Large quantities of milk are heated to a minimum temperature for a minimum amount of time in batch pasteurization. Flash pasteurization involves raising the temperature quickly for a few seconds similar to how milk is pasteurized in milk plants. General guidelines for pasteurization are 145° F (63° C) for 30 minutes for batch pasteurization and 162° F (72° C) for 15 seconds for flash pasteurization.

Research examining the effects of pasteurization on Mycoplasma concluded that 158°F (70°C) for three minutes was necessary to inactivate the Mycoplasma organism. Recent research which evaluated the effectiveness of pasteurization on *M. paratuberculosis*, the organism that causes Johne's, suggests that flash pasteurization is more effective in eliminating the organism; however batch processing at 145° F (63° C) for 30 minutes does not totally eliminate the organism.

To monitor the effectiveness of the pasteurization procedures, producers should collect random samples to be cultured for bacteria counts. Keeping a daily log of who pasteurized the milk with the temperatures and times recorded will also help maintain consistency. Provide additional training and review sessions for employees to avoid breakdowns in the SOP as well as review the SOP as new information becomes available.

Cleaning all equipment is essential. The easier the system is to clean, the more likely it will be done routinely and properly. Producers should perform random inspections of all equipment and utensils as part of their SOP.

If waste milk is fed, it should be pasteurized to maintain acceptable growth and health of replacement animals. Like many other practices, pasteurizing milk is not recommended for all dairies.

Dairy Advisory Teams: Managing for Success

Dana Cole and W. M. Graves
University of Georgia

Identifying and managing production problems on a dairy often takes a back seat to the day-to-day activities required to put milk in the bulk tank everyday. When the daily process of dairying takes more than an 8 hour workday, it may seem impossible to sit down and evaluate the records and identify areas where changes in the management or facilities might have a big impact on profitability and efficiency. Many producers may feel more like an "emergency response unit" than a manager, responding to the daily cow health and management "fires" that break out. However, there's no doubt that a dairy is a business, and every successful business venture sets goals, seeks efficient means to achieve those goals, and evaluates the progress toward meeting those goals.

Every day it seems like there are more environmental regulations, new diseases, new technologies and increasing costs for a dairy producer to deal with. Sorting through all this information and making the decisions that are best for the dairy may require the expertise of more than one person. A Dairy Advisory Team can be an affordable resource for producers who wish to set and meet health or production goals, improve problem solving or increase profitability on their dairies. A team approach to dairy problems allows for a division of labor, improves communication between the people involved in your business and focuses the energy of these people toward the solution of a single problem at a time. An advisory team takes advantage of several areas of expertise and provides outside perspectives to help the producer accomplish long term business objectives. The old adage that two heads are better than one really is true.

For example, low milk prices and high feed costs may be financially devastating to a producer. In this case, addressing several issues at once may prove to be the best solution to the problem. The ration may be evaluated and adjusted to take advantage of lower cost commodities. Cow records may be studied to identify health problems and those animals that are not producing at an acceptable level. Nutritional management and facilities may be examined to decrease waste and improve feed utilization. A Dairy Advisory Team composed of a nutritionist, veterinarian, agricultural economist, forages expert and a cooperative extension fieldperson can address all of these simultaneously and provide a comprehensive plan suited to your particular management. Individually each person can give advice, but only as a team can they get the big picture and prioritize changes and provide an integrated plan.

Large dairies have easy access to these experts—often having a veterinarian and a nutritionist on staff—and regularly take advantage of several resources at once. However, putting together a Dairy Advisory Team for your operation may seem expensive and impossible. On the contrary, the members of a Dairy Advisory Team are people that you already utilize on a regular basis. The overall expense is no more than what you are already spending to run your operation, but the economic returns may be considerable. Putting a team together simply requires getting these individuals together and insuring that they work in a coordinated fashion with a common goal. You may want to assign a team coordinator and ask them to help you put together the required team. Alternatively, faculty at the University of Georgia can help you put a team together. If you want to learn more about Dairy Advisory Teams and what they can do for you, or if you need help putting one together, please contact:

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The Dairy Map Website Will Help Analyze Your Herd's Performance

J. W. Smith, L. O. Ely, and W. D. Gilson
Extension Dairy Scientists

Most dairy producers want to improve the performance of their herds. But, improvement is impossible if you can't identify management weaknesses. Comparing your herd to the performance of other herds is one way to identify management shortcomings.

Years ago DHI 'testers' would average the production of their herds by hand. These summaries provided a way to compare production among herds, set goals for improvement and monitor progress. Later in the 1950's and 60's, computers began processing DHI records and calculating summaries. DHI herd summaries were published by USDA, dairy record processing centers as well as state and county extension offices. The summaries listed averages for milk production and other management values for herds located within a county, state or region of the country. The internet now offers a new and easy way to compare herd performance and measure progress.

The Dairy Management Analysis program (Dairy Map) evaluates herd performance on the Web using DHI herd summary information. Management values from a producer's DHI herd summary report are compared with benchmark values of similar size herds located in the same region of the country.

Benchmarks are standards that can help measure your herd's performance and help you set goals for improvement. Let's assume the summit milk production of your second lactation cows is 80 pounds. Determining whether this is poor, good or excellent production is difficult without a benchmark for comparison. Dairy Map benchmarks are calculated using Holstein herd summary records processed by Dairy Records Management Systems (DRMS), Raleigh, NC. A diagram outlining the Dairy Map system is shown in Figure 1. Help pages describe how to enter information and interpret reports. General Herd Information includes name, state and selection of a herd size group. You are asked to enter thirty-five items of information in the Herd Summary Information section.

The Dairy Herd Management Evaluation Report is produced after the requested information is entered. This report is divided into three sections which target potential problem areas. In the first section, production, feed cost, somatic cell count, reproduction and genetic values for your herd are compared to percentile rankings of other herds of similar size located in your region. Percentile values nearest to your herd values are highlighted. This allows you to quickly identify how your herd ranks with other herds.

Earlier benchmark comparisons were usually based on averages. Although still useful, averages may be misleading especially if there is a lot of variation among cows in a herd. In contrast to averages, percentiles allow comparisons across a range of values and show the relative position of your herd in relation to other herds. Table 1 shows an example herd with a milk rolling herd average of 21,032 pounds. This level of production is nearest the 90^{th} percentile. Herds with milk production of 21,821 pounds or more would rank in the top 10 percent of all herds of similar size in this region.

The Milk Production and Management Analysis sections compare your herd's performance to the average for herds within your region by rolling herd average. Herd values for summit milk, stage of lactation production and standardized milk are compared under the Milk Production Analysis section. Somatic cell count and reproduction values are compared under the Management Analysis section. An example Milk Production Analysis section is shown in Table 2. Values under the rolling herd average column nearest to your herd's value are highlighted. In this example, summit production of second lactation cows is under a lower rolling herd average compared to the other two lactation groups. The average summit production for first and third + lactation groups is about what is expected for herds with a 21,000 pound rolling herd average. Daily average milk production is listed by stage of lactation. Average production of cows in milk between 200 and 304 days (52 pounds) is lower relative to cows at other stages of lactation. Herds with a rolling herd average of 18,000 pounds on average produce 52 pounds of milk between 200 and 304 days. Information in this table can be used to estimate the average level of production needed at various stages of lactation to achieve or maintain a specific rolling herd average.

Dairy Map requires the user to decide which management areas require further analysis based upon the percentile and rolling herd average rankings. More detailed evaluations for Somatic Cell Count, Production, Genetics and Reproduction are available. The detailed evaluation section compares herd performance by lactation group and stage of lactation. Your herd is compared to other herds in your region which have similar rolling herd averages. The difference between your herd and other herds is expressed as a percentage. The percentage is converted to a series of asterisks ranging from 1=poor to 6=excellent. This report allows you to easily detect problem areas and also the relative extent of the problem. An example of a Milk Production by Stage of Lactation Detailed Report is shown in Table 3. In this example, it's obvious that first lactation cows in mid to late lactation have lower than average production.

Dairy Map is available at no charge but first time users must register in order to access the program. The website location is (http://dairymap.ads.uga.edu). Following each session, users are asked to fill out a short evaluation form. This information will assist in program improvement and development. We welcome comments and suggestions from Dairy Map users.

Table 1. Dairy Herd Management Evaluation

Herd Owner	**State**	**Herdcode**	**Cows**			
Dairy Producer	Georgia	57000000	Up to 100			
	My herd	**Percentile Rank**				
		10th	**25th**	**50th**	**75th**	**90th**
Rolling Herd Average						
Milk (lbs)	21032	13510	15599	17908	19775	***21821***
Protein (lbs)	650	432	492	562	***624***	680
Fat (lbs)	735	455	544	622	701	***763***
Protein (%)	3.1	3.0	3.0	***3.1***	3.2	3.2
Fat (%)	3.5	3.0	3.3	***3.5***	3.6	3.9

Table 2. Milk Production Analysis

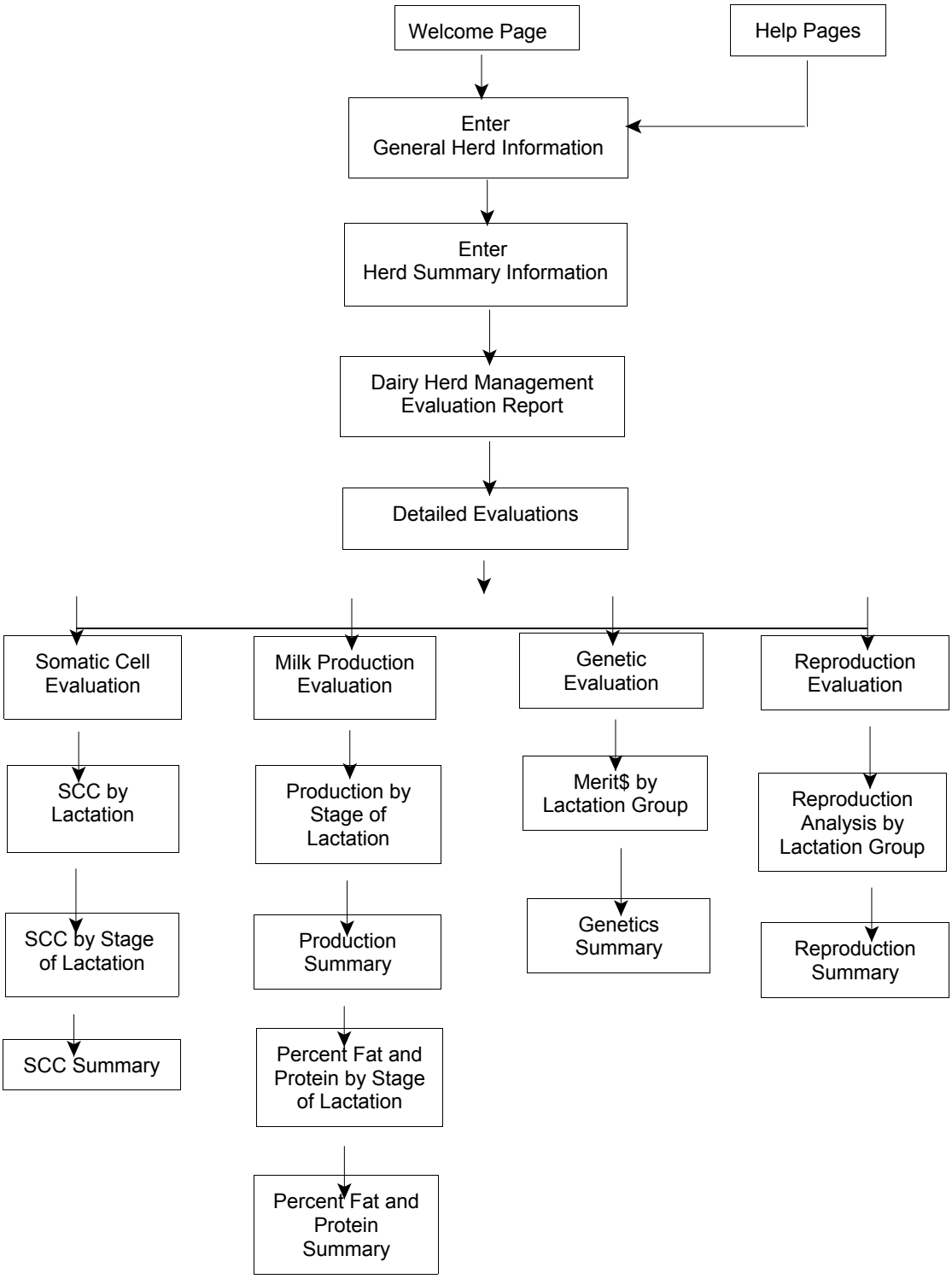
		Summit Production by Rolling Herd Average (1000's)								
	My Herd	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**
1st Lactation	69	53	55	58	61	63	65	68	***69***	74
2nd Lactation	81	62	65	70	74	78	***81***	86	86	92
3rd+ Lactation	93	68	71	75	78	82	85	90	***92***	98
All Lactations	81	62	64	68	71	74	76	***80***	82	87
		Daily Milk Production by Rolling Herd Average (1000's)								
	My Herd	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**
Days 1-40	75	59	60	62	64	68	72	***73***	73	80
Days 41-100	80	58	61	65	68	71	74	77	***78***	85
Days 101-199	70	51	53	56	59	64	66	69	***70***	77
Days 200-304	52	41	44	47	48	***52***	56	57	60	***67***
Days 305+	46	34	34	37	39	41	44	46	49	***54***

Table 3. Milk Production by Stage of Lactation

Group	**Stage of Lactation**				
	1-40	**41-100**	**101-199**	**200-305**	**305+**
1st Lactation	***	***	**	**	**
2nd Lactation	***	***	****	*****	*****
3rd Lactation	****	***	***	*****	*****
All Lactations	***	***	***	****	****

Legend	
Excellent	***** to ******
Average	*** to ****
Poor	* to **

Figure 1. Diagram of Dairy Map



How About AI Techniques?

W. M. Graves and L. E. McKee
University of Georgia

It is well known that daughters from artificial insemination (A.I.) sires produce more milk than those bred by natural service. Incorrect A.I. techniques can lower the overall success rate of your breeding program. At one time, most producers learned correct techniques in semen handling and insemination procedures, but unfortunately, many have developed some bad habits. Reviewing proper procedures should help eliminate some of these mistakes!

Keep your semen tanks in a secure, clean and dry place away from corrosive chemicals. Your tank's location should allow for easy moving for filling with liquid nitrogen. Tanks should be stored in a visible place, and the nitrogen level should be checked regularly. Only store about a six month supply of semen. Make sure your investment is insured and secure. Always check the semen inventory list prior to removing semen from a tank to make sure each time that the correct canister is used. Semen should not be lifted above the frost line in the neck of the nitrogen tank. Dangerous temperatures exist in the upper half of the neck. Exposure will lower subsequent fertility.

Store insemination equipment in a clean, stainless steel box. This box should be closed when not in use. Also, all equipment should be clean when returned to the box. Always maintain sterility of the plastic sheaths used to cover the straw gun.

Restrain and identify the cow to be bred before thawing the semen. Be sure that the cow being bred is in heat. Use the am/pm rule or breed at a specific time after hormone treatment.

When preparing the AI gun remove the plastic straw of semen from the goblet quickly with tweezers and not fingertips. This helps to keep the straws in the goblet below the frost line and avoids warming the straw too quickly. It is generally recommended that only one straw be thawed at a time. If more than one straw is thawed, they should be agitated to prevent the possibility of freezing together during thawing. If synchronizing animals you can thaw up to 3 straws together if you are using them within 15 minutes.

Shake the straw after it is removed from the tank to eliminate any drops of nitrogen at the end of the cotton plug. This will prevent the plug bursting off when it is put in the water bath. If you have a large group of animals to inseminate, have one person thawing and another breeding animals.

A one pint, wide mouth thermos and a dial thermometer work well for thawing straws. Semen should be thawed in 95°F water for 45 seconds. Electronic thaw devices are handy, especially DC versions that can be used in trucks. Maintain accuracy by regularly checking temperatures and calibrating your thermometer. After the straw is thawed, dry it off with a clean towel and check the printed information on the outside of a straw to verify the bull's identity. Record the bull next to the cow's number. Maintain an accurate semen inventory. This can be easily done on PCDart.

Use semen within 15 minutes of thawing. Time should be watched carefully, especially when thawing multiple straws. In cold weather warm the gun by rubbing it with your hands. Dry the straw with a clean paper towel and place the end with the cotton plug in the gun. Cut the sealed end at a 90 degree angle about 1/4 inch from the lab seal. If the straw is not cut squarely, the plastic sheath may not seal tightly against the straw. Some semen will then back flow between the sheath and the straw, rather than going inside the cow. A ½ cc straw contains about 10 drops of diluted semen; therefore, each drop lost is 10 percent of the total contents and sperm numbers. Place a sterile plastic sheath over the gun and seal it. Wrap the end in a paper towel to prevent exposure to the sun and to maintain sanitation. Then place the end of the gun in your shirt or pants pocket to maintain temperature on the way to the cow. During hot weather, do not place the insemination gun in direct sunlight or on hot surfaces.

After the gun is readied, clean the region of the vulva to prevent contamination of the inner reproductive tract. If you are not completely sure the animal is in heat, pick up the cervix and uterus and see if you get a clear mucous discharge from the vulva. This is a good sign!

Insert the gun in the cow upward at a 30 degree angle. This avoids entering the bladder. Remember that inseminating a cow does not require much force or pressure. Do not poke around with the gun. Try to move the cervix around and bring it to the gun. Take your time, relax and concentrate on your technique. If the cervix is over the rim of the pelvis, pull it back towards you where it is easier to insert the gun. If you are getting caught in the folds of the vagina, try stretching the cervix away from you to free your gun and allow a clearer entry into the cervix.

Semen should be deposited in the body of the uterus. This area is less than one inch long and is about the size of a dime. It is located immediately in front of the cervix. A common mistake is to deposit the semen several inches into the right uterine horn.

Feel the end of the gun with your finger when you are just outside the cervix. Be sure the gun is passing through the cervix and that you are not just stretching the vagina. When the tip of the insemination gun passes through the front ring of the cervix, it is in the uterine body. Check the location by placing the index finger in front of the cervix. You should just be able to feel the tip of the gun.

After you feel the tip of the gun, lift your index finger and slowly deposit the semen over a 5 second period. Be sure that your fingers are not misdirecting the flow of semen or blocking a uterine horn. Reposition the gun each time the animal moves.

If the cervical mucus of a cow previously bred feels thick and sticky, the cow may be pregnant. On repeat services, it is best to deposit the semen just past the half-way point of the cervix. Be careful.

If you find blood on your glove, be gentle. Concentrate on placement. Practice proper sanitation procedures. Don’t give up on the hard ones, they too will work.

Researchers at the Pennsylvania State University developed techniques in radiography years ago to evaluate accuracy of insemination very clearly. These techniques overcome some of the limitations of the dye techniques. A study was reported in which 20 professional technicians and 20 owner-inseminators were evaluated using the radiography technique. Each inseminated a total of 20 reproductive tracts. Two radiographs were taken to access inseminating gun placement. The second radiograph was taken to access semen deposition.

This data showed that only 39 percent of the gun tip placements were in the uterine body. A total of 25 percent of the gun tip placements were in the cervix. 23 percent were in the right uterine horn, and 13 percent were in the left uterine horn. Sixty percent of the semen was distributed in the cervix or disproportionately in one uterine horn. Only forty percent of the semen was located in the uterine body or equally distributed in both uterine horns.

The normal ratio of ovulation or release of eggs is approximately 40 percent from the left ovary and 60 percent from the right. Since migration of embryos is rare, the pregnancy ratio should be the same, 40 percent left uterine horn and 60 percent right uterine horn. This is an easy way to have your veterinarian check on the job you are doing with correct semen placement. Data on as may pregnancies as possible is required for a proper evaluation.

The need for retraining may be necessary because many have not yet mastered the expertise required for proper gun tip placement and insemination. A goal of first service conception rates of 50 percent or more and fewer than 2.0 services per conception is reasonable.

Practice good insemination techniques. Consider retraining. It may help improve your herd’s fertility. Your cows can’t make up for your mistakes in improper semen handling and placement.