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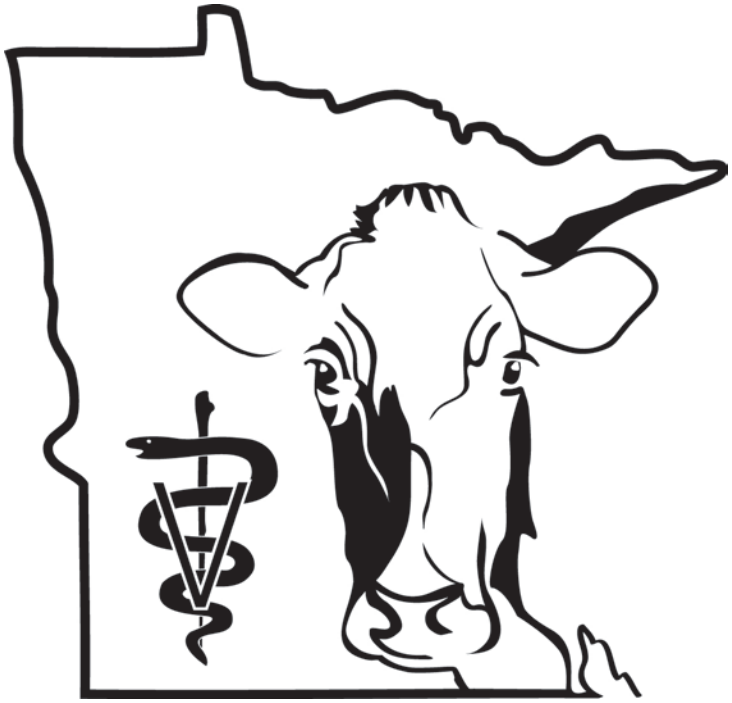

ST. PAUL, MINNESOTA
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Managing, Monitoring, and Medicating the Transition Cow

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Introduction

Inauguration of the lactation. Milk production is a byproduct . . . a coproduct of reproduction. Therefore, from a physiological standpoint, calving is the start of the lactation. Managerially, however, many top dairymen and their advisors consider the dry period the beginning of the lactation (2, 3).

Critical time. The period from dry-off to three weeks postpartum is the most important time in the reproduction-lactation cycle of the cow (11). It sets the stage for the entire cycle. The events of this period greatly affect the health, reproduction and milk production of the following lactation. Controlling metabolic and infectious diseases during this time pays great dividends. A basic truth is that a healthy cow will give more milk and have better reproduction.

Transition phases. The period has three basic divisions: Far-off dry cows, close-up dry cows, and early fresh cows. The far-off dry cow period is a time of rest, repair, and regeneration. Key items include the following:

- Involution of the mammary gland
- Reconditioning of the rumen
- Rest and repair of feet and legs

The close-up dry cow phase is a dynamic time metabolically and physiologically. Key events include the following:

- Allometric growth of mammary gland tissue
- Proliferation of rumen papillae
- A rapidly growing fetus
- Declining dry matter intake

The early fresh cow phase is also a dynamic time. Important metabolic and physiologic developments include the following:

- Continued growth of mammary gland tissue
- Accelerated proliferation of rumen papillae

- Increasing milk production
- Lagging dry matter intake

Drying-Off

Purpose of dry period. A dry period is necessary between lactations. Cows milked continuously give less milk the following lactation. Cows not allowed a dry period after completing their first lactation produced 75% as much milk in the second lactation and 62% as much milk in the third lactation compared with cows they allowed a 50- to 60-day dry period (16).

Hurley (13) makes an interesting observation: He points out that the requirement for a dry period between lactations may be peculiar to the dairy cow. Consider that most species are not concurrently pregnant and lactating. Generally, they exhibit some level of lactational anestrus. Therefore, these animals only start cycling after weaning, so they have a nonlactating period before the next lactation.

Kilmer (16) points out that a successful dry cow program should accomplish several key objectives. They are as follows:

- Provide proper nutrition for the developing fetus
- Provide condition and replenish body reserves, as necessary
- Prepare the mammary gland for the next lactation, including mastitis treatment
- Prepare the digestive tract for the next lactation
- Control health disorders near calving and during the next lactation

Pregnancy reconfirmation. Confirming a cow's pregnancy status before drying-off is important. Errors in calving dates are costly. Consider the following example: The breeding date is off 100 days, production is 70 lbs., milk price is $14/cwt.

100 days x 70 lbs./cow/day = 7000 lbs. = 70 cwt.

70 cwt. x $14/cwt. = $980

An even worst case is the cow that the herdsman turns dry that is not even pregnant. To prevent such costly errors, the herdsman or veterinarian should reconfirm all pregnancies before drying-off.

Accurate breeding dates can be a real problem in natural service herds. Frequent pregnancy exams help accurate prognostication of due dates. A veterinarian should palpate all open cows each forty-five to sixty days. Intervals greater than sixty days may result in inaccurate prediction of calving dates.

Net marginal return. Before drying off a cow a dairyman should evaluate a cow's production records, physical condition, price of milk, cost of production, cull cow cost, replacement cost, etc. The crucial point is profitability. What is the best return? Possible outcomes are twofold:

- Keep the cow - dry off
- Cull the cow - sell and replace

Dry cow procedures. Two methods are common: intermittent milking and abrupt cessation. Intermittent milking is where a dairyman lengthens the milking interval (i.e., 12 to 24 hours).

Abrupt cessation is where the dairyman simply discontinues milking the cow.

Both methods have their advocates; however, abrupt cessation is the usual recommendation (12, 16). Cows milking more than 50 lbs. daily may require some modifications of technique. The most common, and most successful, method is to disrupt the cow's normal routine (12, 16):

- Changing the environment (i.e., a different group, a different barn, etc.)
- Switching to a lower quality of forage
- eliminating or reducing all grain

In addition, the herdsman should continue to milk these high producers until daily production declines significantly. Then they may dry them off. Limiting water should be a measure of last resort. In herds using BST, the dairyman should remove these cows from the product at least two weeks before dry off.

Length of dry period. Many research projects have sought to identify the ideal length of a dry period. The goal of a dry period is to attain a balance between the gains in production and profit from extending the current lactation, with any losses in production and profit in the following lactation because of fewer days dry (KI.LMER). Table 1 provides useful information on the effect dry-period length and production in the next lactation. Data from this study support the standard recommendation for a dry period of 40 to 70 days.

Table 1. Effect of length of dry period on milk yield in the next lactation.*

Days dry	Differences in milk production from herdmates (lbs.)
5-20	-1289
21-30	-629
31-40	-166
41-50	189
51-60	298
61-70	313
71-80	169
81-90	63
more than 91	7

*Source: Kilmer (16)

Table 1 shows periods less than 40 days or greater than 70 days result in reduced milk and profits. An average of 50 to 60 days is the ideal, but distribution is important. A recommended

pattern of distribution is as follows:

- Cows dry <40 days: none or 2 to 3% (should only be abortions, premature calves)
- Cows dry 40 - 70 days: 85%+
- Cows dry >70 days: <10%

Keeping a desirable dry-period distribution in natural service herds is a challenge. Frequent pregnancy exams (i.e., 45 - 60 days) will prevent cows from having excessively long or short dry periods.

Others factors studied to learn the optimum dry period to maximize production over two consecutive lactations include age, calving interval, and daily milk production on day 100 prepartum. Kilmer (16) cited the following:

- Optimal days dry declined from 65 to 23 days as age increased from 24 to 83 months
- Cows with calving intervals <340 days required at least 55 days
- High producing cows required longer dry periods
- As 100th-day milk increased from 28 lb. to 42.5 lb., the cows required an additional 12-17 more days dry
- Requirements of a dry period diminish as cows age

Slow-breeding cows often have longer dry periods due to lower milk production with extended lactations. Dry periods longer than 70 days result in increased feed and other costs with little additional benefit as to increased milk production in next lactation (see Table 1.). Whether to dry off or sell these cows is a common dilemma. As a rule of thumb this writer recommends the following guideline: If a cow is giving <30 lbs. of milk and >30 days from calving, we should sell her. Exceptions to this rule may include the following:

- Excuse a lame cow to allow her to return to health
- High SCC cows to allow for enhanced therapy and to remove them from the bulk tank
- The herd is in expansion mode
- Economics of cull cows, milk price, replacement cost, etc.

Mammary gland physiology. Understanding the changes that the mammary gland undergoes is helpful to our understanding of the physiological events demanding a nonlactating period between lactations. Three distinct phases characterize the dry cow period: active involution, steady state involution, and udder regeneration (10, 13).

Active involution: Initiation of this phase begins 12 to 24 hours after last milking of dry off. It encompasses a period of transition of the tissue from a lactating to a nonlactating state. Time for this process to take place is about 3 to 4 weeks.

Steady state involution: Phase where the mammary gland enters a nonlactating steady state.Characterizing this stage is the occurrence of little activity until a few weeks before parturition.

Udder regeneration: Starting about 3 to 4 weeks before calving, the mammary gland begins to regenerate secretory tissue in preparation for the upcoming lactation. Progression to a state of active milk synthesis is a time of intense mammary growth.

Before the next lactation occurs two things need to happen: 1) a loss of secretory cells, and 2) regeneration of new cells. Cows milked continuously have less cell loss and buildup. Consequently, we will affect more production. For the udder to completely involute it takes three

to four weeks. Therefore if we make an error in record keeping and the calving date is less than 21 days away, then we may as well keep on milking the cow (12).

Early Dry Period

Dry cow therapy. Treating dry cows serves two purposes. It reduces subclinical mastitis and prevents new mastitis infections (1, 2). The incidence of new mastitis infections is over six times higher in the dry period. Periods of peak susceptibility during the first 3 weeks after dry off and again just before parturition (Table 2). Reported rates of new infections in the dry period in cows not treated range from 3.8% to 35.1% of quarters (15).

Pathogens of both contagious and environmental origin cause new dry period infections (15). Exposure to contagious pathogens decreases at dry off. On the other hand, exposure to environmental pathogens continues throughout the dry period. Rates of new infections during the dry period vary widely from herd to herd. We see low infection rates in those herds that keep their cows in clean, dry environments that reduce exposure to environmental agents.

TABLE 2. Occurrence of new mastitis infections during the dry period.*

Week of dry period	Weeks before calving	% of new infections
1	-	36
2	-	24
4		0
-	2	4
-	1	18

*Source: Kilmer (16)

Methods of dry cows therapy. Two methods employed by dairyman are 1) blanket dry cow treatment and 2) selective dry cow treatment. The preferred method (1, 2 12) is the former. Key advantages are as follows:

- simple to adopt
- reaches all infected quarters
- more effective than selective
- laboratory and screening procedures not necessary

Total treatment costs are higher for this method; however, the economics still favor treating all quarters of all cows at dry off. Use blanket therapy when either of the following conditions exists (1):

- the bulk tank SCC> 500,000
- four or more clinical cases/10 cows/three days

- the quarter infection rate> 16%
- the individual cow SCC average for all cows >250,000

Canadian workers (1) make the following recommendations for selective dry cow therapy: Use dry cow therapy when 1) the monthly bulk tank SCC stays consistently below 200,000 and the quarter infection rate is less than 16%. Treat only the following cows:

- individual cows with peak SCC> 250,000
- cows that had clinical mastitis during lactation
- cows that cultured a major mastitis organism

Treatment protocol. Most mastitis researchers advocate a system of treating all quarters of all cows. Teaching dairymen proper technique in dry cow therapy is serious. Failure to treat cows properly can make matters worse than not treating (1). This practitioner recommends the following protocol:

1. Wear disposable latex or nitrile gloves.
2. Milk the udder out completely.
3. Immediately following teat cup removal, dip all teats in an approved teat dip.
4. Dab excess dip from teat ends with a single-service towel.
5. Allow adequate contact time.
6. Starting with the teats on the far side of the udder, disinfect the teat ends by scrubbing with a separate alcohol-soaked cotton swab.
7. Starting with the teats on the near side of the udder, infuse each quarter with a single-dose syringe of the recommended treatment.
8. Insert the cannula only 1/4 inch into the teat end before infusing.
9. Massage the treatment up into each quarter.
10. Immediately following treatment, dip all teats in an effective teat dip

Body condition management. Cows should freshen at a body condition score (BCS) of 3.0 to 4.0. Ideally, 3.5 is the optimum BCS for calving. Cows should dry off at a 3.5 BCS, maintain this score throughout the dry period, and freshen at this ideal score (8, 18, 22).

Fat cows (>4.0 BCS) have more problems at calving and during the postpartum period (18, 22). Maintain condition on these cows. Do NOT let them lose weight. It just sets them up for a fatty liver.

Also, heifers should calve at 3.5 BCS. A common misconception is that heifers may calve at higher BCS than cows. Work by Shirley (21) at Kansas State disputes this idea. Holstein heifers fed to BCS of 4.0 and maintained for the last 60 days before calving experienced a high incidence of subclinical ketosis and displaced abomasums. Of 35 first-lactation cows, 17 experienced a displaced abomasum with the first 30 days after calving. Shirley (21) notes that the risks associated with calving first-lactation cows at a BCS of 4.0 or more outweigh the potential benefits of increased body fat stores on early lactation.

Focusing on cows' BCS during the lactation period is necessary to optimize BCS at the end of lactation. I recommend scoring cows at pregnancy exams, then adjusting feeding to get them in an optimum BCS before going dry.

TABLE 3. Target body condition scores.*

Stage	Ideal Score	Range
Dry-off	3.50	3.25 - 3.75
Calving	3.50	3.25 - 3.75
Early lactation	3.00	2.50 - 3.25
Mid-lactation	3.25	2.75 - 3.25
Late lactation	3.50	3.00 - 3.50
Growing heifers	3.00	2.75 - 3.25
Heifers at calving	3.50	3.25 - 3.75

*Source: Ferguson (8)

Vaccination and disease resistance. Many dairymen and veterinarians view the dry period as an excellent time to enhance a cow's resistance to disease. Vaccinating at dry off can booster colostral antibodies and enhance overall disease protection. Vaccines commonly given defend as follows:

- Calf scours
- Coliform mastitis
- Leptospirosis
- Clostridial disease
- Bovine respiratory disease (IBR, BVD, BRSV, and PI_3)

Other products commonly given at this time are vitamins and antioxidants (7). Many dairymen give injections of vitamin E-selenium and vitamin AD.

Hoof care. The dry period is a good time to improve hoof health. Cows trimmed around dry-off have approximately two months for rest and recuperation.

A frequent debate is whether to trim all cows or select cows before drying-off. Regardless, the dairymen's goal should be that all cows freshen with healthy feet and legs.

Large herds often have a professional trimmer come weekly and they trim those cows going dry that week. Smaller herds may only trim monthly. Some owners or herdsmen trim their cows' hooves. Poorly trimmed feet are worse to than not trimming at all. Available from Nasco is an excellent videotape on how to correctly trim cows' feet by Dr. Roger Blowey. I frequently recommend this tape to dairymen and veterinarians.

Facilities for dry cows. Dairymen do not need to provide elaborate housing and handling facilities. Housing facilities should meet key animal husbandry criteria (9, 18):

- Good, clean air
- Ample feed bunk and water space
- Clean, dry, comfortable resting area

- nonabrasive, slip-resistant floor surfaces
- good lighting

Suitable housing will vary according to the area of the country. In the temperate regions, cows need little housing. They need protection from extremes of hot weather. Shade, water and ample feed bunk space are minimal requirements. Shed-type structures generally provide suitable housing. Cooling is seldomly done, but research shows it to be quite beneficial.

In the colder regions, cows have greater housing needs. Protection from extremes of cold and inclement weather become necessary. Various barn designs are suitable. Figures 2 - 9 offer some common examples (4).

Close-up Dry Cows

Prefresh facilities. Dairymen should have special facilities for close-up dry cows. They should move cows into these groups approximately three weeks before calving. Several types of facilities are suitable. They should meet the basic criteria outlined previously (see dry cow facilities). Tramp sheds are a popular choice for prefresh cows. Keeping them clean, dry and comfortable is important. Allow resting areas of 100 ft^2/cow. Provide feed and water outside these areas to ease sanitation. Housing location should allow for frequent observation of close-up cows. Also, good lighting should be available.

Maternity Area. Cows should calve in the best environment possible (12, 18). The final hours before parturition, dairymen should move cows to special maternity pens or small-group pens (3). Maternity stalls should be spacious, 12' x 12' or 14' x 14'. Small-group pens (i.e., 24' x 40') also work well. They should provide resting areas of 100 ft^2/cow. Location and lighting should allow for easy observation.

Maternity areas should have a head catch for individual isolation. Catching the cow should be easy for one person. A person can then offer assistance to the calving cow. Figure 1 illustrates a practical working facility (19). Having the chute area slope toward the head catch is desirable so the operator does not have to kneel in the accumulated fluids (3). The side of the chute should be gates so that can be opened widely to allow working room (3, 19).

Calf Delivery. Instructing key personnel on the dairy how and when to properly deliver a calf is essential for cow health and calf survivability. A common problem of inexperienced herdsmen is hastily helping the cow in delivery. Premature intervention may result in damage to the dam and subsequent infertility. Dairymen should intercede after reasonable periods of labor. Allow heifers more time than cows. Cervical dilation takes longer in heifers. Table 4 summarizes these differences.

Dystocia (difficult calving) is a frequent problem. Key determinants are the degree of cervical dilation, the size of the pelvic opening, and the size and presentation, position and posture of the calf (3). Presentation is whether the calf is coming forward or backward. Position is the relationship of the calf's spine to that of the dam. Posture is the relationship of the calf's extremities to itself (Table 5) (3).

TABLE 4. Average calving pattern for heifers and cows.*		
Age	Stage I[1] Labor (hours)	Stage II[2] Delivery (hours)
Heifers	2 - 4	1 - 2
Cows	1 - 3	½ - 1

*Berry (3), Cady (5)

[1]Stage I: parturition process involving cervical dilation and uterine contractions to position the calf correctly.

[2]Stage II: parturition process involving by abdominal contractions and expulsion of the fetus.

TABLE 5. Various dystocia problems of presentation, position, and posture.*			
	Presentation	Position	Posture
A	Anterior	Dorsal	Front leg bent under & backward
B	Anterior	Dorsal	Forelegs bent under
C	Anterior	Dorsal	Foreleg forward over neck
D	Anterior	Dorsal	Head down, between forelegs
E	Anterior	Dorsal	Head up, over neck
F	Anterior	Ventral	Forelimb bent under
G	Anterior	Dorsocervical	Hindlegs extended forward (head & feet)
H	Posterior	Dorsosacral	Hindlegs & forelegs bent under (rump first)
I	Posterior	Dorsosacral	Hindlegs bent under (rump first)
J	Posterior	Ventral	Hindlegs & forelegs under (fetus on its back)
K	Posterior	Dorsosacral	Head down, all feet presented
L	Anterior	Dorsolumbar	Forelegs & highlegs normal (shoulders first)

*Source: Cady (5)

When they decide to intervene, certain guidelines are necessary. Being as sanitary as possible is important since much fertility following dystocia is probably due to introduction of bacteria by unsanitary obstetrical techniques (3). I recommend the following:

- Secure the cow, restrain in a head catch.
- Tie her tail off to the side. Tie the rope around the cow's neck, not to the stanchion.
- Wash her perineum and vulva thoroughly with disinfectant soap.
- Operators should also thoroughly wash their arms and hands.
- Wear sleeves to decrease contamination and protect the operator's arms.
- Disinfect chains, OB handles, etc.
- Use expanding lubricants (e.g., cellulose or polyethylene derivatives to maintain lubrication).
- Use a systemic approach to dystocia (see Table 5 and Figure 10).

Early Fresh Cows

Fresh cow facilities. I believe having special facilities for fresh cows is necessary to optimize dairy cattle performance. Getting dairymen to construct facilities to handle early postpartum cows is one of our greatest challenges today. Fresh cows need frequent observation, and the best way to do this is to house them in small groups. Ideally, the group size should equal to parlor size. For example, I like a 16-cow facility for a double-8 herringbone parlor.)

These facilities do not need to be elaborate (Figures 2 - 8) (4). They do, however, need to follow the basic rules of cattle housing (see dry cow facilities).

Health monitoring. Two cliches come to mind: "If you can't measure it, you can't monitor it," and "If you can't monitor it, you can't manage it." Monitoring metabolic and infectious disease lets us know whether management needs to make a change. Ideally, we would like to not have any health problems; realistically, we need to keep them at acceptable levels. What are tolerable levels for high producing dairy cattle?

Jordan (14) surveyed some top producing herds in the country. The study analyzed 61 Holstein herds with an average production of 24,412 lbs. of milk. Average herd size was 244 cows. An incidence rate of postcalving disorders was as follows:

- Retained placenta= 9%
- Milk fever= 7.2%
- Displaced abomasum= 3.3%
- Ketosis= 3.7%
- Downer cows= 1.1%

These incidence levels infer that high producing herds can have low rates of postcalving problems. Field observations of high producing herds support these survey results (6, 17, 20).

Treatment protocol. Many dairymen are treating their own cows. Our role is changing to that of an advisor. As such, we advise farm personnel in the correct usage and recommended withdrawals. I find the best way to do this is by using written procedures or protocols. Figure 11

is a recommended flow chart for diagnosing and treating fresh cows. Table 6 gives detailed dosage and withholding information for the various products.

Summary

1. Milk production is a byproduct of reproduction.
2. The period from dry-off to three weeks postcalving is the most important time in a cow's life.
3. Successful management of far-off, close-up and early fresh phases set the stage for the subsequent lactation.
4. A dry period of 40 to 70 days is necessary between lactations to optimize milk yield.
5. Reconfirming the pregnancy status of cows at dry-off is a vital management practice.
6. Net marginal return is simply evaluating each cow's individual merit to see if she or another cow should occupy her position in the herd.
7. An average of 50 to 60 days dry is ideal, but distribution of dry periods is equally important.
8. Abrupt cessation is the preferred method of drying off cows.
9. Undergoing two things in the dry period is necessary for the udder: 1) loss of secretory cells, and 2) regeneration of new cells before the onset of lactation.
10. Dry cow therapy reduces subclinical mastitis and prevents new infections during the early dry period.
11. Most dairy scientists recommend treating all quarters of all cows at dry off.
12. Practitioners should give dairy personnel detailed procedures (protocols) for turning cows dry, doing a physical exam, doing a vaginal exam, delivering calves, treating fresh cows, etc.
13. Cows should go dry and freshen at a BCS of 3.5.
14. The dry period is an excellent time to enhance a cow's resistance to disease.
15. Housing facilities for dairy cows should provide 1) good, clean air, 2) ample feed bunk and water space, 3) clean, dry comfortable resting area, 4) nonabrasive, slip-resistance floor surface, and 5) good lighting.
16. We should move cows to special maternity pens or stalls just before calving.
17. Cows should calve in the best possible environment.
18. Proper preparation, facilities, and equipment will yield large returns in calf delivery: increased cows saved, improved calf survival, and decreased postpartum reproductive problems.
19. Getting dairymen to have facilities to handle early postpartum cows is one of our greatest challenges today.
20. If you can't measure it, you can't monitor it and if you can't monitor it, you can't manage it.
21. As more dairymen treat their own cows, our advisory role shifts to advising farm personnel about correct dosage and recommended times to discard milk and withhold animals from slaughter.

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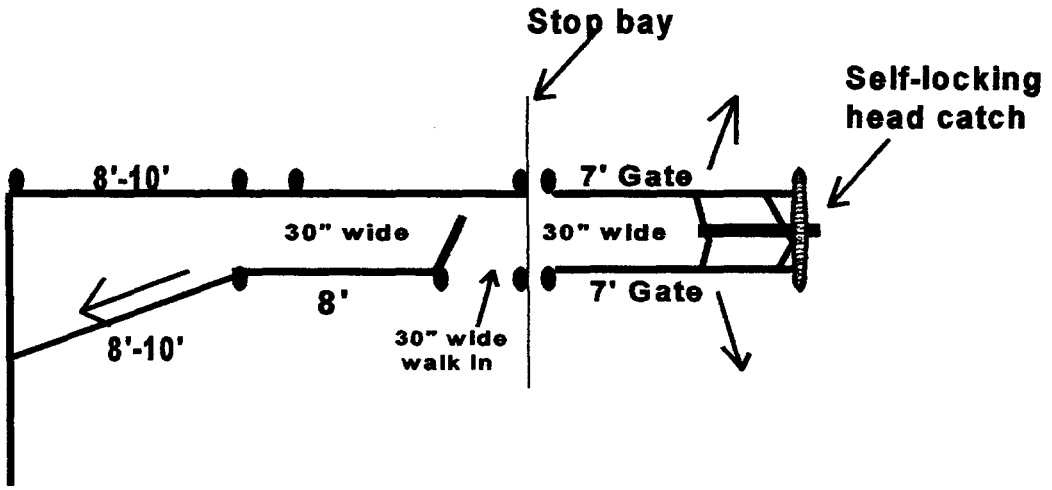

Figure 1. Diagram of a basic cattle handling facility with self-locking head catch, swing-away gates, and a walk in.

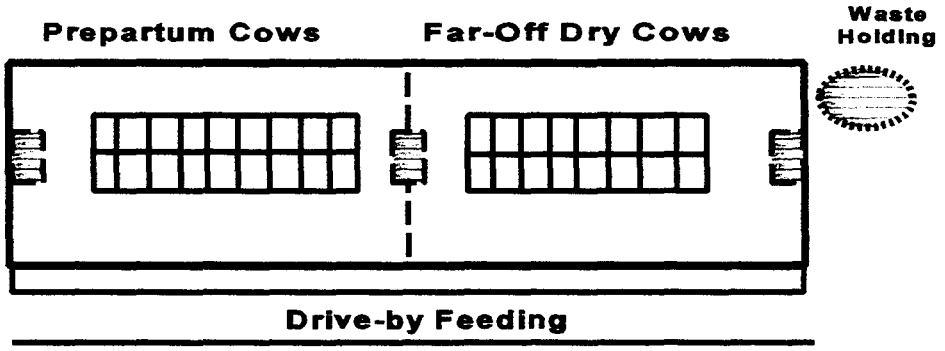

Figure 2. Diagram of a freestall barn for two groups of dry cows.

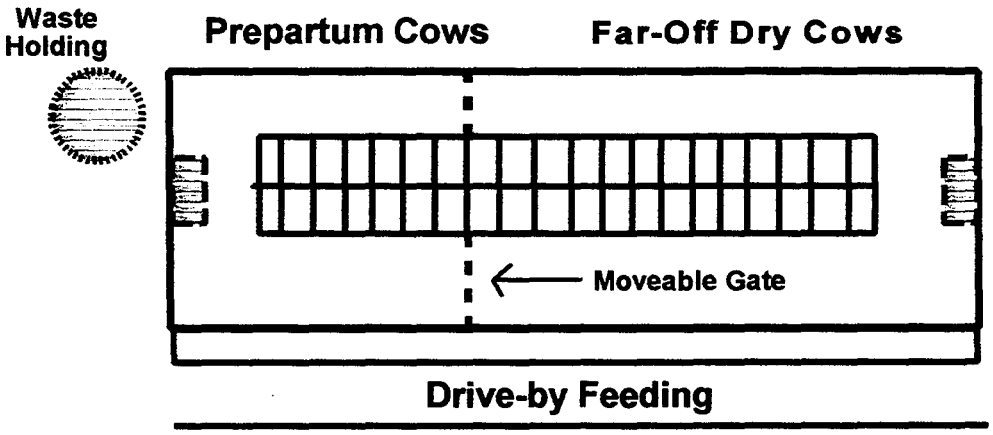

Figure 3. Diagram of freestall barn for dry cows that permits adjustable group sizes.

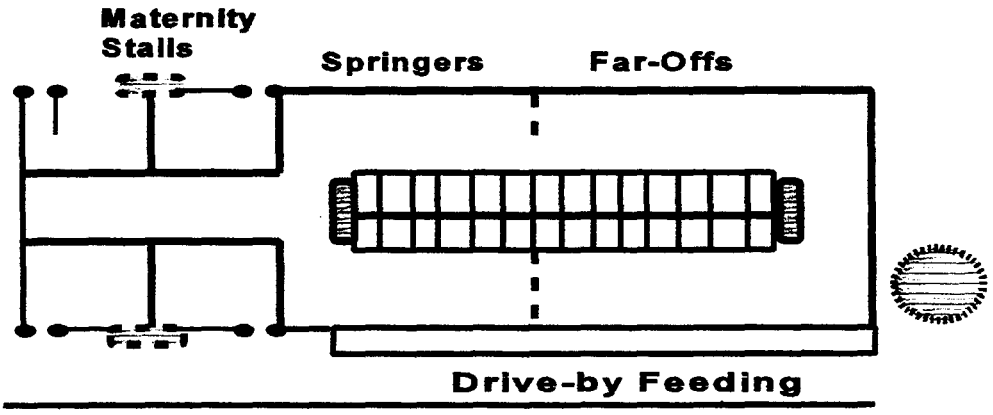

Figure 4. Diagram of a freestall barn that also includes maternity stalls at one end.

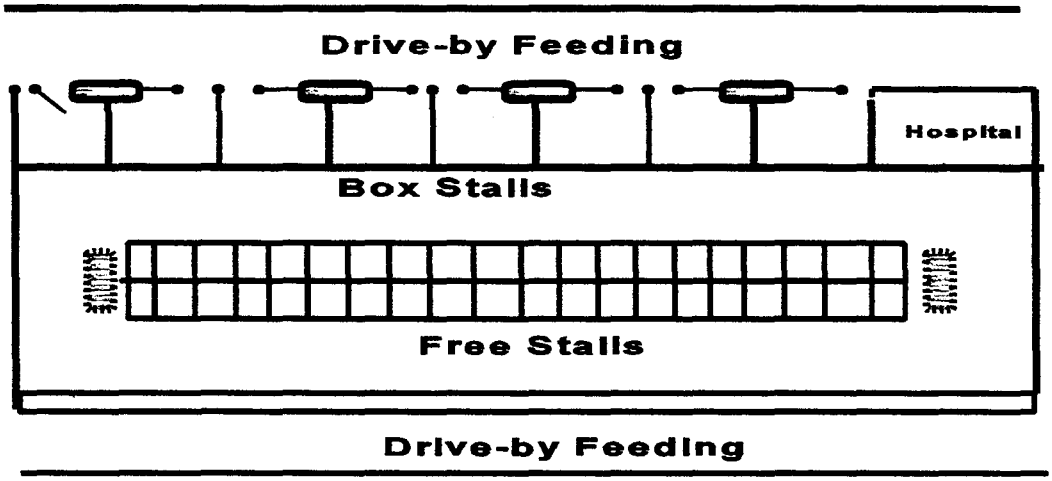

Figure 5. Diagram of a freestall barn with maternity stalls and hospital along back wall.

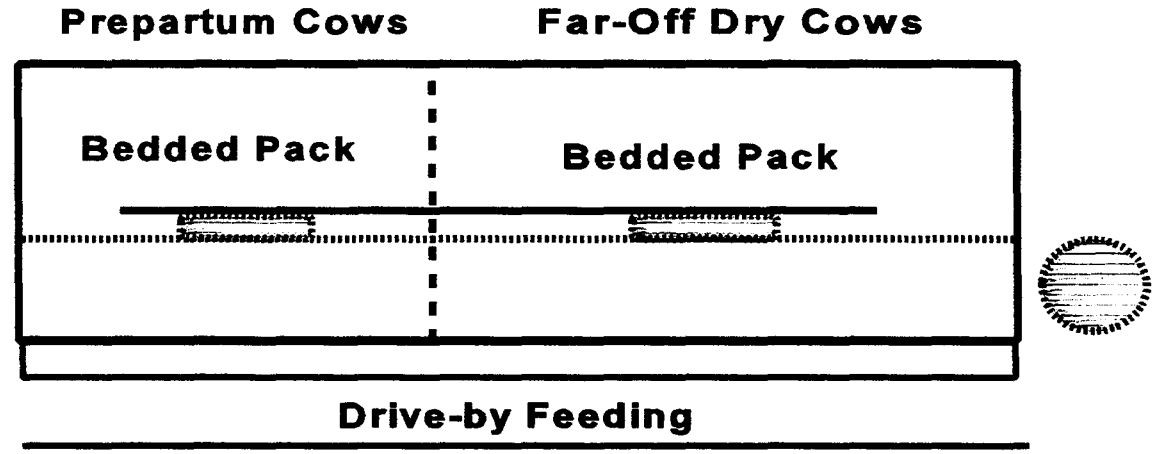

Figure 6. Diagram of barn for two groups of dry cows that employs the use of a bedded pack.

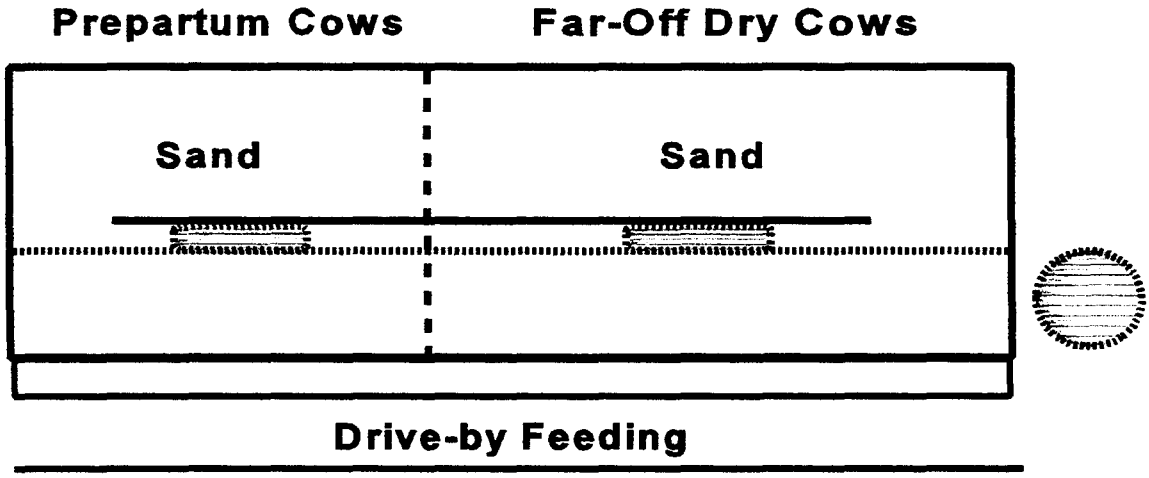

Figure 7. Diagram of a beach barn for two groups of dry cows.

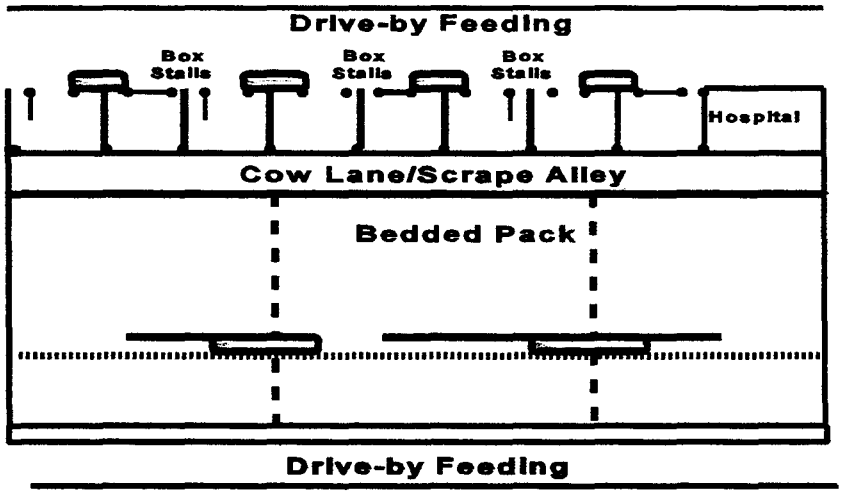

Figure 8. Diagram of a barn for dry cows with a bedded pack resting area, maternity stalls and a hospital.

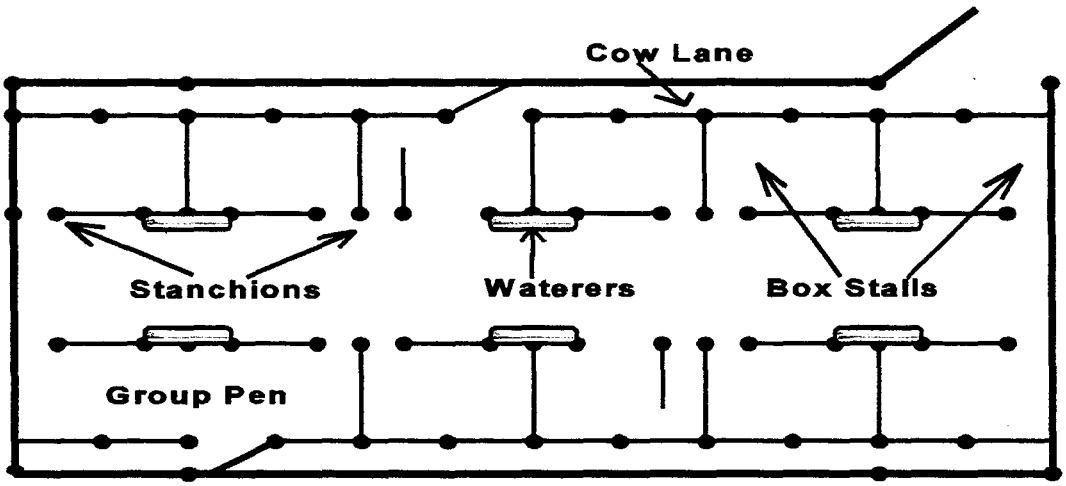

Figure 9. Diagram of a barn with maternity stalls and an adjustable group pen.

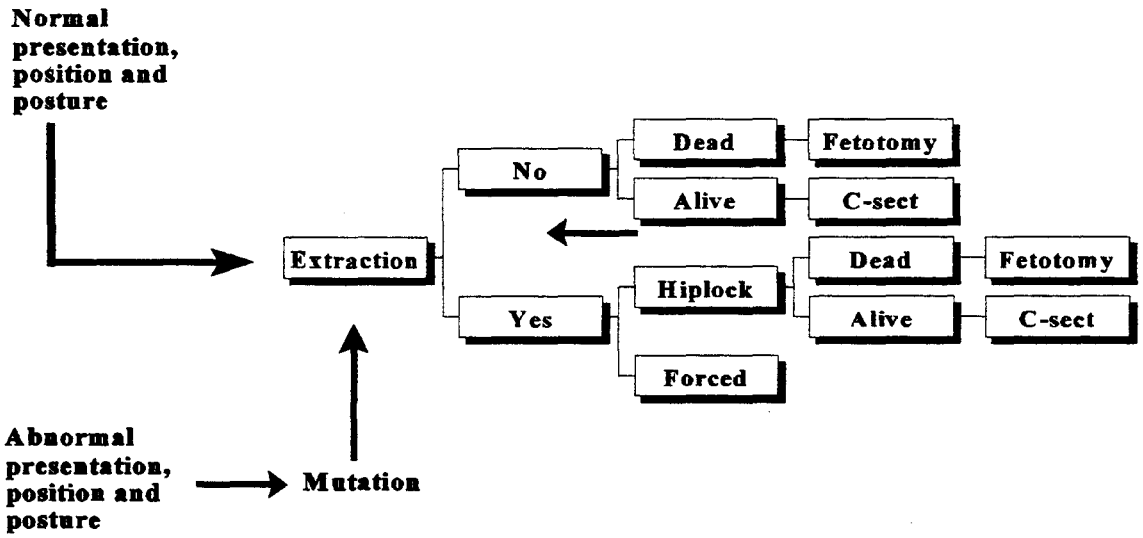

Figure 10. A systematic approach to dystocia

Source: Berry (3)

FRESH COW PROTOCOL

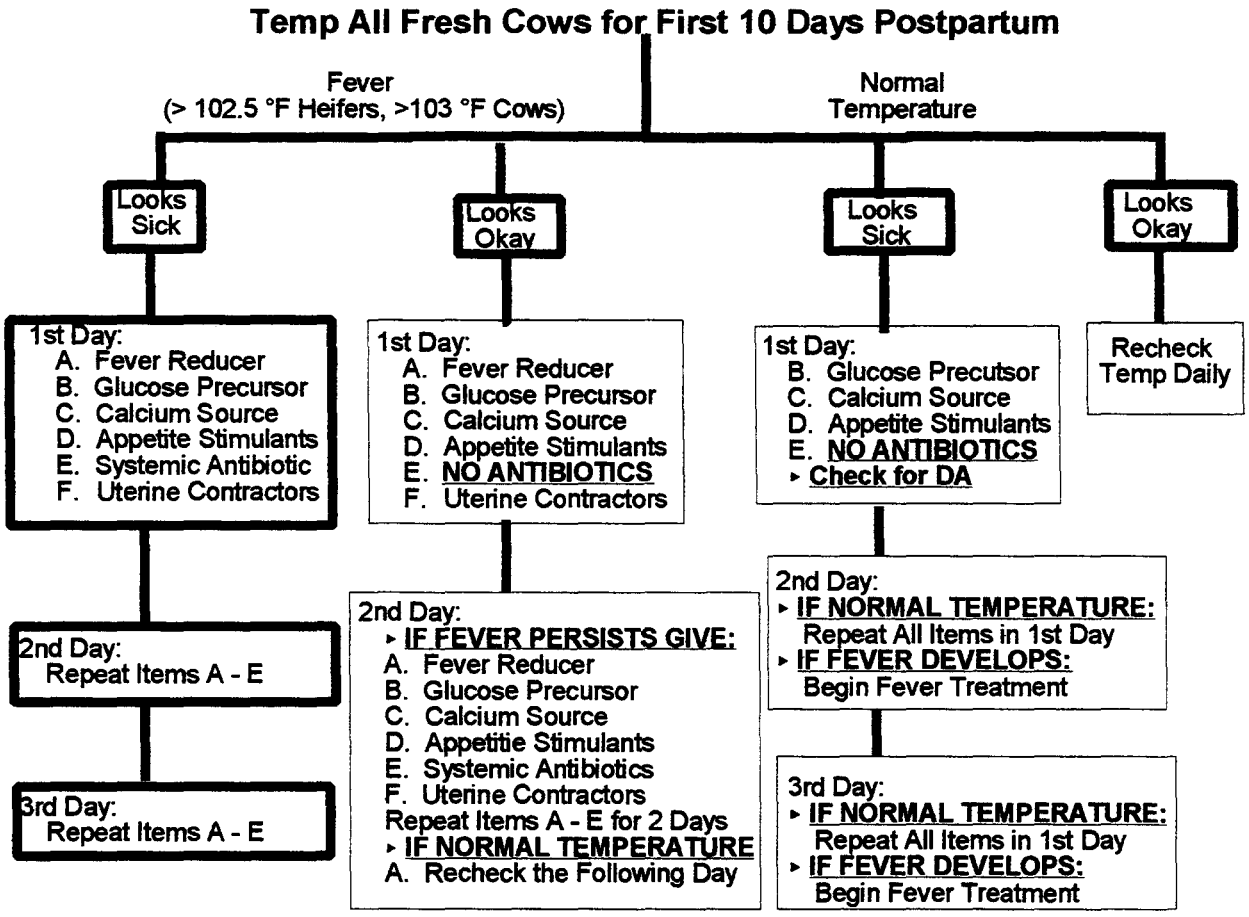

Figure 11. Flowchart for diagnosis and treating fresh cows .

REFERENCE: Dr. G.L. Upham, Personal Communciation

TABLE 6. Drugs for fresh cow program

TYPES	DRUGS	DOSAGE	MILK W/H (Hrs)	MEAT W/H (Days)
Fever Reducers[1]	Aspirin Boluses	6 - 8 Orally	0	0
	Phenylbutazone Tabs	6 - 8 Orally	72	7
	Phenylbutazone Inject	30 mL then 20 mL IV	72	7
	Flunixin Injectable	10 - 12 mL IM	72	7
Glucose Precursors[1]	Propylene Glycol	8 - 16 oz Orally	0	0
	Calcium Propionate	4 - 8 oz Orally	0	0
	Dexamethasone	4 - 5 mL IM	0	7
	Predef 2x	10 - 12 ml IM	0	7
Calcium Source[1]	Calcium Propionate	4 - 8 oz Orally	0	0
	Oral Calcium Gel	1 Cartridge Orally	0	0
	IV Ca Borogluconate	500 mL IV	0	0
Appetite Stimulants[2]	Yeast Culture	16 oz Orally	0	0
	Alfalfa Meal	48 oz Orally	0	0
	Salt, White (NaCl)	4 oz Orally	0	0
	Dyna-K (KCl)	4 oz Orally	0	0
	B-Comlex Injectable	20 - 50 mL IM	0	0
Systemic Antibiotics[1]	Penicillin Procaine G	40 - 80 mL IM/Sub Q	96	21
	Polyfex (Ampicillin)	12 - 20 mL IM	48	21
	Naxcel (Ceftiofur)	12 - 20 mL IM	0	0
	Amoxicillin	12 - 20 mL IM	96	25
	OTC 100 mg/mL	50 - 100 mL IV	96	21
Uterine Contractors[3]	ECP	1 - 2 mL IM	72	7
	Oxytocin	5 mL Oxytocin IM	0	0

[1] Select only one product from this category to use.

[2] May select a combination of products from this category.

[3] Use ECP on 1st day only; do not repeat on subsequent days. You may repeat ECP on day 14 if cow shows purulent (pus) discharge.