

A Goal-Oriented Approach to Herd Health and Production Control

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Introduction

Since the turn of the century, veterinary services to dairy farms have developed in 4 stages. The first was concerned with controlling the major infectious livestock diseases. The second began after World War II with increased productivity and permitted emphasis on treatment of individual cattle. During this period, significant advancements occurred in vaccine production, medicine and surgery. These were the catalyst for the third stage, preventive medicine, which began in the late 1950's and early 1960's. Its acceptance, although slow at first, was brought about by rapid developments in housing, milking, nutrition, genetics and further increases in productivity and average herd size. Successful control of contagious diseases by vaccination and sound management procedures resulted in improved animal health in large herds.

The preventive medicine programs based on vaccinations and reproductive work were eventually well received by dairymen and practitioners. Dairymen were keeping breeding records and needed pregnancy status to accurately determine drying-off, calving dates and culling. Veterinarians quickly became involved and set up periodic and regular farm visit schedules. As dairymen recognized the benefits from a reproductive preventive medicine program, they requested similar programs for replacement rearing, mastitis control and nutrition.

The fourth stage, herd health and production control, began in the middle to late 1970's. As the dairy industry moved toward intensive large-scale production units, both the size of the dairy and the total volume of production increased while costs per unit decreased. Marginal competence is critical to economic survival of enlarging enterprises so small errors are not multiplied with large numbers of animals. During this time, dairymen recognized "production diseases" that limited efficiency. The development of large scale highly-mechanized dairy farms introduced the use of consultants for animal health services, and management assistance. An expanded market for nutritionists, extension specialists, dairy herd improvement program consultants, management consultants, laboratory scientists,

economists, and bankers developed with little involvement of veterinarians. Consequently, veterinarians encounter considerable skilled competition in this area. If veterinarians are to meet the challenge of herd health and production control of today's large-scale, highly-mechanized dairy enterprises they must broaden their interest and knowledge from diseased to "healthy" animals and change from classic veterinary surgeons to an agricultural management and economic thought mode. They must be familiar with specific farm situations, and gain an optimal strategic position to monitor, evaluate, and control farm production.

To meet this need, veterinary students and practitioners must be knowledgeable in pathophysiology and be trained to implement herd health (HH) and production control (PC) programs. This paper presents practical guidelines for replacement rearing, udder health and milk quality, reproduction and nutrition. These guidelines should expedite:

- cooperation with the dairyman in identifying his/her objectives;
- establishing guidelines for reaching these objectives;
- evaluating and analyzing animal and farm data in relation to these objectives.

The ultimate objective of a HH and PC program is to improve farm income by utilizing highly technical skills, advising, evaluating and analyzing actual and accurate records and to implement these programs in a cost-effective way.

Methods

1. Replacement Rearing Guidelines

A. Objectives (Goals)

1. Rearing replacement heifers should be based on improving herd genetic level with yearly increase of ≥ 300 lbs. milk (projected ME 305 days) for 1st calf heifers above 2nd and later lactations.
2. Rearing costs for home bred heifers should be justified economically; otherwise commercial heifers should be purchased. In this case, atten-

tion must be paid to genetic expectancy, age at calving, body weight, conformation, acclimation, health status and costs.

3. Of all the female calves born, an optimum number should be reared. Of these > 80% should survive and calve at 24 months-of-age.
4. Replacement heifers (HF breed) should be inseminated at first heat beginning at 14 months-of-age at a body weight of 750 lbs. (340 kg) and a pelvic height of 51 inches (125 cm).
5. Replacement heifers (HF breed) should calve at 24 months-of-age, weigh 1150 lbs. (525 kg) after calving and have a pelvic height of 56 inches (136 cm).
6. Replacement heifers should be reared if milk production level of the herd is above the state average. Dairy men with below average milk production should use their management effort to increase production rather than diluting it with a calf rearing program.

B. Implementation

1. Tools

- a. Calf Rearing Chart with the following headings:
 - 1a. identification, sire and dam, date of birth, date of weaning,
 - 2a. date of introduction into pasture,
 - 3a. date of vaccination and deworming,
 - 4a. advised month of insemination, insemination dates, result of pregnancy check, expected date of calving,
 - 5a. dates of weighing + deviation from standard,
 - 6a. health disorders - type and date,
 - 7a. remarks e.g., culling date and reasons.
- b. Farm Checklist
 - 1b. a calendar with time-related veterinary and agricultural items to examine or to discuss with the farmer.
- c. Target growth curve or table;
 - 1c. scale or tape.
- d. Colostrometer and/or test kit to control immunoglobulin (Ig) level in calves.
- e. Feeding standards
 - 1e. NRC requirements, including pasture management.
- f. Clinical examination
 - 1f. supplementary examinations (blood, feces, etc.).
- g. External information:
 - 1g. reports from laboratories (necropsy)
 - 2g. slaughter house check
 - 3g. sire information lists

2. Farm Visit Activities

During farm visits, several aspects are monitored or activities performed as a routine procedure

while other aspects are examined only periodically. The Calf Rearing Chart and Farm Checklist are consulted.

- a. Calving management
 - 1a. choice of sire and dam on genetic merit and type traits;
 - 2a. nutrition in the dry period and around calving;
 - 3a. prevention of udder edema;
 - 4a. stress prevention and hygiene at calving;
 - 5a. gradual change to lactation ration
- b. Colostrum management (time and quantity of first colostrum feeding)
 - 1b. Immunoglobulin-Ig-level control (use of colostrometer)
 - 2b. blood sampling for Ig testing
- c. Examination of housing and climatic conditions
 - 1c. hygiene
 - 2c. temperature, ventilation, draft
 - 3c. bedding
 - 4c. separation of calves according to age, over-crowding.
- d. Examination of (sub) clinical health disorders:
 - 1d. diarrhea
 - 2d. respiratory diseases
 - 3d. parasitic infections (roundworms, lungworms, liver flukes, ectoparasites)
 - 4d. laboratory reports
 - 5d. necropsy
- e. Control of nutrition and growth:
 - 1e. milk replacer, whole milk
 - 2e. quality of roughage, and concentrates
 - 3e. fresh drinking water
 - 4e. management around weaning
 - 5e. ration formulation according to current standards
 - 6e. feed bunk management
 - 7e. pasture management
 - 8e. body condition scoring
 - 9e. growth of total young stock herd evaluated at least twice yearly, more frequently if necessary. Check on deviations from target curve.
- f. Performance of vaccination programs against viral, bacterial and/or parasitic infections.
 - 1f. preventive measures against summer mastitis
 - 2f. examination of heifers purchased
- g. Control of breeding records:
 - 1g. advised breeding dates
 - 2g. pregnancy examinations
 - 3g. sire advising lists

- h. Written report with evaluation/analysis and recommendations sent to the farmer after each farm visit.

C. Evaluation and Analysis in Relation to Objective Set

This can be performed by using one or more of the following items:

GOALS
(Florida)

- 1. Number of calves born per year or per month
- 2. Number of calves born dead and those that have died by 24 hours after birth:
 - a. Cows < 8%
 - b. heifers < 10%
- 3. Number calves dead between:
 - a. 24 hours - 2 months-of-age < 6%
 - b. 2-5 months-of-age < 2%
 - c. 5 months to breeding age < 2%
- 4. Number calves/heifers culled up to calving < 2%
- 5. Number calves/heifers sold for veal and/or breeding purposes
- 6. Frequency distribution of mortality in relation to age and diagnoses
- 7. Frequency distribution of fertile breedings of heifers
- 8. Frequency distribution of calves and heifers (age groups) above and below optimum weight according to age (target growth curve)
- 9. Estimation of economic losses due to mortality, rearing costs and missed production days
- 10. DHIA records, projected ME 305 days
 - a. 1st calf heifers compared to 2nd and later lactation >300 lbs milk

D. Control

The information, evaluation and analysis obtained from farm visits must serve to optimize calf rearing methods. In addition, this information will show a momentary profile of the replacement rearing program which will enable farm management to become more transparent. Therefore, advice given on farm management practices regarding health status, treatment and prevention of health disorders, nutrition and growth can be justified. A written report including recommendations, should be sent to the dairyman within 3 days following each scheduled farm visit. If necessary, goals should be reset.

II. Udder Health Milk Quality Control Guidelines

A. Objectives (Goals)

- 1. On a yearly basis 75% of the cows in the herd should be free of clinical mastitis (< 3% mastitis cases per month).

- 2. Repeat cow cases of clinical mastitis should average less than 1.5 per affected cow per year.
- 3. Bulk milk somatic cell count should be < 300,000/ml.
- 4. If individual somatic cell counts are performed, 85% of herd should be less than 400,000/ml.
- 5. Bulk milk bacteria count should be < 5000/ml and other milk quality deviations should be absent.
- 6. Milking equipment should be evaluated after 1200 milkings per unit and deviations corrected, including changing inflations.
- 7. Mean culling rate for udder health reasons should be < 6% per year.
- 8. Mean percentage of teat injuries should be < 2 per year.

B. Implementation

- 1. Tools
 - a. Milk sampling
 - 1a. > 10% clinical quarter cases
 - 2a. bacterial culturing and antibiotic sensitivity testing
 - b. Milk sampling of bulk tank once monthly
 - 1b. bacterial and mycoplasma cultures
 - 2b. perform somatic cell and bacterial count (pre and post-pasteurization bacteria counts)
- c. Herd Mastitis List with the following headings:
 - 1c. identification
 - 2c. calving date
 - 3c. quarter treated, dates treated
 - 4c. date cow returned for saleable milk + culturing results
 - 5c. drying-off date + advice
 - 6c. remarks or culling date
- d. CMT or other somatic cell count diagnostics
- e. Clinical examination of udder and teats
- f. Milking equipment diagnostics
 - 1f. air flow meter
 - 2f. vacuum recorder
 - 3f. manometer
 - 4f. voltmeter
 - 5f. thermometer
- g. External information
 - 1g. bulk milk or individual somatic cell count
 - 2g. bulk milk bacteria count
 - 3g. milk quality deviations
 - 4g. milking equipment evaluation report
 - 5g. milk production records
 - 6g. laboratory results
- h. Teat dipping
- i. Dry cow treatment
- j. Culling advice

2. Farm Visit Activities

During the farm visit the following examinations, routine procedures or managerial aspects have to be monitored and/or performed.

a. Clinical Mastitis Situation

- 1a. estimation of the herd situation of clinical mastitis since last farm visit(s) as determined by the Herd Mastitis List
- 2a. advice on treatment of clinical cases based upon: recent laboratory reports, sensitivity of udder pathogens involved, type(s) of antibiotic, route of administration, duration of treatment, post-treatment recovery control
- 3a. examination of housing, climatic and hygiene conditions of both lactating and dry cows: evaluation of nutrition
- 4a. clinical examination of udder and teats. Evaluation of dry cow treatment; teat dip use
- 5a. observe mastitis treatment procedures, use of home mixes, sanitation of teat cannulae
- 6a. collection of deep frozen samples from clinical quarter cases for culturing and antibiotic sensitivity testing

b. Subclinical Mastitis Situation

- 1b. examination of bulk milk cell count(s) and/or individual somatic cell counts
- 2b. periodic herd CMT and quarter sampling for culturing; somatic cell count testing, if not performed regularly, should be carried out especially if:
 - objectives for the clinical mastitis situation are not met
 - bulk milk cell count is above objective level
 - an acute herd outbreak of clinical mastitis occurs

c. Milking Equipment Function, Milking Procedure and Hygiene

- 1c. check periodically on the air reserve capacity of pump, the function of regulator and pulsator and the presence of stray voltage
- 2c. discuss milking equipment evaluation reports and check on advised repairs
- 3c. check on changing inflations after
$$\frac{1200 \times \# \text{ units}}{2 \times \# \text{ cows}} = \dots \text{days}$$
- 4c. examination of pre-milking sanitation, fore milking, attachment + adjustment + detachment of the clusters, over-milking, intervals between handlings, use and quality of teat dip, bulk milk bacteria count, milking equipment washing

procedures and refrigeration

d. Dry Cow Treatment

The choice between selective or total herd treatment is mainly determined by the:

- 1d. herd mastitis situation
 - 2d. frequency distribution of pathogens cultured
 - 3d. frequency distribution of clinical cow cases versus lactation stage
 - 4d. level and course of bulk milk or individual somatic cell counts
 - 5d. individual cow history of mastitis
 - 5e. antibiotic sensitivity test
- ### e. Culling Problem Cows
- 1e. culling advice must be given based upon mastitis history (number of cases, pathogens cultured, curing rate) and prognosis
 - 2e. advice has to be given irrespective of milk production level and genetic merit
 - 3e. Note: Cows purchased should be checked for mastitis pathogens by CMT and culturing before they are added to the milking herd

C. Evaluation and Analysis in Relation to Objective Set

1. Clinical Infection Rate

- a. Number of cows affected
- b. Number of cow cases per 100 cows per year and/or per month
- c. Number of quarter cases per affected cow
- d. Number repeat cow cases per affected cow
- e. Number of cows culled for mastitis/year
- f. Frequency distribution of cow cases versus lactation days lost due to discarded milk
- g. Frequency distribution of cow cases versus lactation stage/parity/season
- h. Frequency distribution of culturing results versus season

2. Subclinical Infection Rate

- a. Number cows tested for somatic cell count
- b. Number cows with cell count $>400,000/\text{ml}$ (also in %)
- c. Number newly detected cows with cell count $>400,000/\text{ml}$ (also in %)
- d. Frequency distribution of number cows with cell count above $400,000/\text{ml}$ versus parity/season/lactation stage/culturing results

3. Economic evaluation of losses due to subclinical and clinical quarter infections: 40% average milk production loss per infected quarter (or 10% per cow) for the remainder of lactation.

D. Control

The information, evaluation and analysis, obtained from farm visits must serve to reduce the occurrence

of new quarter infections and the duration of existing infections. In addition, this information will show the momentary profile of the herd udder health and in general makes farm management more transparent. Therefore, advice given on farm management practices regarding treatment and prevention of mastitis can be justified.

A written report should be sent to the dairyman after each farm visit and discussed with him at a later date. If necessary, goals should be reset in order to improve the herd udder health situation.

III. Herd Reproduction Guidelines

A. Objectives (Goals)

1. Mean herd calving interval should be ≤ 390 days (110 days open) in which individual animals should be identified and inseminated to calve according to production level and parity.
2. Sire selection and herd culling for low production should be aimed at improving herd genetic level with yearly increase in milk production (projected ME 305 days) of $\geq 3\%$.
3. First breeding conception rate calculated on a yearly basis should be $> 40\%$.
4. The average number of breedings per conception calculated on a yearly basis should be ≤ 2.5 .
5. The mean herd culling rate for reproductive reasons should be $\leq 8\%$ calculated on a yearly basis.

B. Implementation

1. Tools

- a. Individual herd health fertility card with the following headings:
 - 1a. cow identification (including sire and dam)
 - 2a. date of birth
 - 3a. date of last calving
 - 4a. history of calving e.g.,
 - 5a. retained fetal membranes
 - 6a. dystocia
 - 7a. sex of calf (twins)
 - 8a. born dead or alive
 - 9a. pre-breeding examination findings
 - 10a. estrus and breeding dates, bull choice
 - 11a. pregnancy examination results, expected calving date
 - 12a. advised drying-off date
 - 13a. milk production level
 - 14a. vaccination dates
 - 15a. health disorders - type and date
 - 16a. culling date and reasons
- b. Farm Journal
 - 1b. daily record of all farm activities
- c. Farm Checklist
 - 1c. a calendar with time-related veterinary and agricultural items to examine or to

discuss with the dairyman

- d. Examination List
 - 1d. cows to be examined and/or treated by veterinarian
- e. External information:
 - 1e. Sire Summary List
 - 2e. DHIA Records
 - 3e. laboratory reports
- f. Clinical examination
 - 1f. rectal and vaginal examination
 - 2f. milk or serum for progesterone profile
 - 3f. culturing results
 - 4f. necropsy
- g. Condition scoring
 - 1g. scale of 1 to 5

2. Farm Visit Activities

During the farm visit, routine procedures and clinical examinations have to be performed on a routine basis, while other aspects such as; The Herd Health Fertility Cards, Farm Journal, Farm Checklist, and External Data may be consulted periodically.

- a. Estrus detection is the foundation for a successful A.I. program

The following factors need to be monitored:

- 1a. identification of animals (bangle tags, brands, etc.)
- 2a. routine pre-breeding examination of reproductive tract for post-partum evaluation and ovarian function
- 3a. examination of reproductive tract of cows greater than 80 days post-partum and not observed to be in estrus
- 4a. labor; number of people involved, skill of labor, time(s) of day observed for estrus
- 5a. estrus detection aids; chalking tail heads, Kamar patches estrogenized cows, penis deviated bulls, chin ball marker
- 6a. climate control; housing, (lights, floor surface), corrals, shades
- 7a. nutrition program; feeding to standards (NRC) during lactation and dry period, condition scoring
- 8a. lameness; laminitis, sole abscess, foot rot
- b. Routine examination of the reproductive tract for pregnancy status
 - 1b. performed at 40-60 days post-breeding
- c. Breeding management decisions
 - 1c. bull choice
 - 2c. days post-partum to begin breeding (production level, parity, condition of reproductive tract)
 - 3c. handling of semen
 - 4c. semen quality
 - 5c. skill of inseminator(s)

- d. Vaccination program
 - 1d. primary concern of fetal wastage and venereal disease
- e. Calving management
 - 1e. concerned primarily with monitoring activities beginning 12 hours prior to and ending 12 hours following parturition

C. Evaluation and Analysis in Relation to Objectives Set

This can be performed by using one or more of the following times:

- 1. Herd reproductive performance is expressed by:

GOALS
(Florida)

- a. Average days open (projected CI) ≤ 110 (12.8 mo.)
- b. Days open are calculated from cows ≥ 60 days post-partum. Cows not to be bred must be excluded.

Average days open may be influenced by one or more of the following factors:
- 2. Estrus detection rate:
 - a. Number of detected estruses
 - 30-52 days post-partum ≥ 75%
 - 53-75 days post-partum ≥ 85%
 - b. Estrus detection trial (24 days) - number of eligible cows to be bred which are detected in heat should be ≥ 85%
 - c. Interestrus intervals (18-24 days) - number of eligible breeding cycles on this interval or multiples of it ≥ 85%
- 3. Interval partus to first insemination:
This interval is approximately 60 days at an estrus detection rate of 85% and if breeding starts by 45 days post-partum.
- 4. Conception rate at first insemination . . . > 40%
- 5. Number of breedings per conception . . . ≤ 2.5
- 6. Number of cows expected to be pregnant when examined at 45-60 days post-breeding . . . ≥ 85%
- 7. Number of cows in herd (examined okay to breed) which are open 100 days or greater without a breeding date ≤ 1%
- 8. Number of cows in breeding herd open ≥ 140 days ≤ 6%
- 9. No. cows culled for reproductive reasons < 8%
- 10. Incidence of retained fetal membrane on a yearly basis < 15%
- 11. Monitor yearly DHIA Summaries for ME 305 day milk production. Desire yearly increase of ≥ 3%.

It may be indicated to make frequency distributions of the various reproductive parameters and factors involved. This may facilitate a proper analysis of an existing reproductive problem. Losses due to extra

days open and extra culling rate must be calculated from time to time in order to stimulate the farmer to take measures to improve herd reproductivity.

D. Control

The information, evaluation and analysis obtained from farm visits must serve to optimize herd reproductive performance. In addition, this information will show a momentary profile of the herd reproductive status and assist in making farm management more transparent. Therefore, advice given on farm management practices regarding reproductive performance, treatment and prevention of reproductive disorders, can be justified. A written report including recommendations should be sent to the dairyman within 3 days following scheduled farm visit. If necessary, goals should be reset.

IV. Nutrition Guidelines

A. Objectives (Goals)

- 1. Income over feed costs: Percentage of receipts from sale of milk required to pay feed cost (all cows) should not exceed 50%.
- 2. Rolling herd average (milk production-DHIA) should exceed state average by > 15%.
- 3. Ration formulation must take into account optimum cost-performance benefits.
- 4. For optimum milk production, cows should be individually fed according to standards (NRC). Dry matter intake (DMI) must be calculated and compared to actual daily consumption.
- 5. Loose housed cows should be grouped and fed according to stage of lactation and production level.
- 6. Dry period: An important function of this period is conditioning of the cow and, particularly the cow's rumen, to the higher levels of milking ration to be fed shortly after calving. Lead feeding should begin during the last 2 weeks of dry cow period and increased to 1% of body weight by calving. Crude protein on a dry matter basis should not drop below 12% during the dry period.
- 7. Condition scoring should be utilized to further monitor an optimum feeding program. Using a scale of 1.0 to 5.0, cows should be directed towards a condition score of 3.5-4.0 during the dry period, 2.5-3.0 during the breeding period, and 3.5-4.0 at drying-off.

B. Implementation

1. Tools

- a. Individual cow production records (DHIA)
 - 1a. parity, production level, stage of lactation, pregnancy status, expected date of calving, health disorders, type, date.

- b. Recommended feeding standards (NRC or equivalent)
 - 1b. computer feeder for individual cows
 - 2b. mixer wagon with scale for group feeding
- c. Optimum ration formulation (cost-performance)
 - 1c. feed stuff fed (lbs., concentrates, roughages)
 - 2c. pasture (date, quality, amount consumed)
- d. Forage and concentrate analysis to determine:
 - 1d. dry matter, net energy (NE), protein, fiber, macro and microelements, vitamins
- e. Clinical examination:
 - 1e. consistency and pH of feces
 - 2e. rumen sampling
 - 3e. metabolic profiling
 - 4e. production diseases
 - 5e. internal and external parasites
- f. External information:
 - 1f. DHIA records
 - 2f. forage analysis reports
 - 3f. feed ingredient costs
 - 4f. laboratory and necropsy reports
- g. Condition scoring
- h. Feed bunk management
- i. Farm Journal (daily record of all farm activities)
- j. Farm Check List (a calendar with time-related veterinary and agricultural items to examine or discuss with the dairyman).

2. Farm Visit Activities

During farm visits several aspects are monitored or activities performed as a routine procedure while other aspects are examined only periodically. Record systems requiring close monitoring and consulting include:

- a. Feed inventory - cost/quantity
- b. Optimum cost ration formulation
- c. Dry matter intake (DMI) - compare to standards
- d. Ration analysis
 - 1d. net energy (NE)
 - 2d. protein
 - 3d. fiber
 - 4d. minerals
 - 5d. vitamins
 - 6d. moisture content (% dry matter)
 - 7d. palatability
 - 8d. concentrate/roughage ratio
- e. Grouping cows according to production level
- f. Feed bunk management
 - 1f. time of day and amount fed
 - 2f. bunk space/cow
 - 3f. time allowed for cows to eat
 - 4f. bunk covered and cleaned daily

- g. Quality and availability of water
- h. Pasture management and estimated consumption
- i. DHIA records
 - 1i. production data - daily and yearly averages, lbs. of milk, % fat test, % protein
 - 2i. peak test day production level (heifers and cows)
 - 3i. persistency index
- j. Condition scoring
- k. Production diseases
 - 1k. incidence of ketosis
 - 2k. milk fever
 - 3k. downer cows
 - 4k. lameness (laminitis)
 - 5k. bloat
 - 6k. acidosis
 - 7k. udder edema
- l. Farm Journal - recording date and changes in ration formulation, and other events relating to nutrition
- m. Farm Check List
- n. External reports
 - 1n. feed analysis
 - 2n. water analysis
 - 3n. DHIA or other production records
 - 4n. necropsy reports, etc.

C. Evaluation and Analysis in Relation to Objective Set

GOALS (FLORIDA)

1. Income over feed costs
 - Cost of feed to produce 100 cwt. milk = <50%
 - Income received from sale of 100 cwt. milk
2. Dry matter intake as a% of body weight to be fed during first 100 days of lactation > 3
3. Actual dry matter intake/head/day compared to calculated values for
 - > 95%
 - each production group (summer) >85%
4. Feed costs per cwt. milk
 - a. Silage (lbs. consumed, energy value)
 - b. Other succulents (lbs. consumed, energy value)
 - c. Dry forages (lbs. consumed, energy value)
 - d. Pasture (lbs. consumed, energy value)
 - e. Concentrates (lbs. consumed, energy value)
5. Milk blend price/cwt.
6. Rolling yearly herd milk production as compared to state average \geq top 15%
7. Average peak test day
 - Milk production as compared to state average
 - 1st calf heifers
 - 2nd and > lactations \geq top 15%
8. Condition Scoring (% meeting goal) >95%
 - a. 30 days post-partum (2.5-3.0)

- b. 90 days post-partum (2.5-3.0)
 - c. Drying-off (3.5-4.0)
 - d. Calving (3.5-4.0)
9. Frequency distribution of herd health disorders in relation to abnormal condition scores
 10. Frequency distribution of peak milk yield in relation to stage of lactation
 11. Frequency distribution of peak milk yield in relation to month of year
 12. Frequency distribution for pounds of milk per day of herd life (750 days-of-age until culled)

D. Control

The information, evaluation and analysis obtained from farm visits must serve to optimize individual cow productivity. In addition, this information will show a momentary profile of the herd nutritional status which will enable farm management to become more transparent. Therefore, advice given on farm management practices regarding nutrition, growth, and health status can be justified. A written report including recommendations should be sent to the dairyman within 3 days following each scheduled farm visit. If necessary, goals should be reset.

Summary

This paper presents guidelines on replacement rearing, udder health and milk quality, reproduction and nutrition. The guidelines are formulated from the following:

1. Objectives: - What goals are we aiming for on a particular farm?
 - a. Are they economically justified?
 - b. Are they obtainable?
 - c. Are they measureable?
2. Implementation: - What are the tools and techniques which are needed to meet these goals?
3. Evaluation and Analysis: - How can we translate accurate records, obtained during a short period of

time, into relevant information for the benefit of the dairyman?

4. Control: - How can we control and/or improve profitable animal production by optimal decision-making?

Consultive decisions regarding profitable animal production must be made in writing to the dairyman as soon as an unwanted situation is detected and/or anticipated.

With the implementation of these guidelines a momentary profile of the performance of a farm can be shown. Therefore, these guidelines should assist in implementing herd health and production control programs in a cost-effective manner.

Conclusion

HH & PC programs can only be applied if simple and practical guidelines are available. Objectives, conditions or available data may differ between farms, states and countries.

Guidelines for the implementation of a HH & PC program must be adjustable to specific farm conditions or management goals. Apart from these guidelines, accurate and complete record keeping is a prerequisite to the optimal function of HH & PC programs. Within this framework, data collected by the dairyman, veterinarian and other agricultural consultants must be handled and processed so that it is relevant information. This information has to be transferred to the dairyman with a minimum loss of time in order to be functional for daily decision-making.

Without the assistance of computers, this information will be retrospective in nature. Computerization of data handling and analysis is an important management tool. By its use, unwanted situations regarding herd health and production control can be prevented or identified early so that optimum farm income is realized.



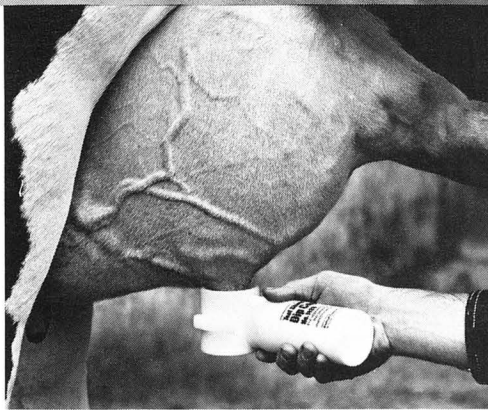
THINK OF 3M TEAT SHIELD™ AS SURGICAL GLOVES FOR TEATS.

Teat Shield is a liquid dip which dries to form a physical barrier against coliform bacteria.

It is the first and only dip clinically proven on commercial herds to help prevent coliform mastitis.

It helps protect cows when they are most prone to coliform mastitis, especially during muddy seasons, freshening, at dry-off and when cows have chapped or injured teats.

Teat Shield goes on like an ordinary dip and starts to work immediately. It dries to form a physical barrier which prevents bacteria from entering the teat canal.



Before the next milking, thoroughly wet the Teat Shield film. The film turns white and comes off as you wash down the teats.

It's non-irritating, non-iodine. Won't cause chapping. And breathes to assist healing.

The cost? About 2 cents per cow per milking. Less than the cost of one lost quarter.

Teat Shield. We recommend you prescribe it when cows are most susceptible to coliform mastitis.

Now available
Teat
Shield™
with Germicide

