

# Production Medicine In Large Dairy Herd

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Dairymen are in business for profit. So are veterinarians. When dairymen and veterinarians work together to manage animal production for profit, their mutually beneficial working relationship is called production medicine.

Dairymen use many professionals to manage their business: accountants, attorneys, nutritionists, service and sales representatives, and veterinarians. But because animal health is so closely associated with animal productivity (especially milk production), the veterinarian is key to the owner/manager of the large dairy enterprise. The dairyman's attitude about how to use veterinary service determines what his veterinarian can do for him.\*

Not all dairy cattle veterinarians are qualified to offer production medicine service. The production medicine practitioner sees his objective not necessarily to alleviate pain and suffering of animals, but rather the economic health and well-being of the dairy owner. The dairy animal is a component of a system designed to generate profit. The production medicine veterinarian understands agribusiness principles along with the science of veterinary medicine. He recognizes profit as the dairyman's goal and therefore the object of his service. This is the professional who can best serve progressive and profitable dairymen.

## Production Medicine Vs. Preventive Medicine

Production medicine is an outgrowth of preventative medicine but the two are not the same. Preventive medicine can be characterized by reproductive programs in which veterinarians routinely palpate cows for dairymen. Here the palpation serves two purposes: 1) to identify postpartum uterine infection and treat it; 2) to verify pregnancy after insemination. The production medicine approach toward reproduction has a different objective. It is to develop the most profitable means for providing future replacement animals for the dairy herd while maximizing milk production for profitability now. The veterinarian still palpates fresh and bred cows, but does so to monitor people and animal performance rather than identifying which animals require treatment. Monitoring assures that fresh cow care, heat detection, breeding, dry cow nutrition and fresh cow feeding are done correctly to maximize herd reproduction. Reproductive records are also analyzed to assess the fertility status of the herd as a unit and to track the status of individual cows. Programs and staff performance are modified when results don't meet targeted goals.

(\*The author recognizes that both woman and men occupy the roles discussed in this chapter (owner/manager, veterinarian and farm staff), but finds the "his/her" format cumbersome. The masculine pronoun is selected since men currently dominate the industry.)

Production medicine is comprehensive herd health. It integrates all areas of health and productivity on the dairy farm. It identifies the different classes of animals on the dairy (replacement heifers, lactating and dry cows, steers and bulls) and devises plans for maximal housing, care and stockmanship of each group. It assesses whether nutritional requirements of all cattle are met to

maximize their production potential and health. Production medicine establishes procedures to detect and treat sick animals but recognizes disease avoidance is as important as proper sick animal treatment. Consequently, appropriate vaccination programs and prophylactic therapy are also part of production medicine programs. A cost-benefit analysis at every step along the way is a major difference between production medicine and simple preventative herd health.

Production medicine focuses on whole herd profitability by maximizing outputs from efficient inputs. Outputs are the expression of each animal's genetic potential. For lactating cows, this is pounds of milk, butterfat and protein per day of lactation. For calves, outputs are rate of gain, livability and disease resistance. For growing heifers, height and weight growth rates. Inputs, on the other hand, are the resources provided for animals to allow them to produce. These include facilities, equipment and feed. Inputs are almost always controlled by people; their stockmanship is a critical input which may either limit or magnify each animals' productivity. In production medicine, the veterinarian assists the owner/manager in determining the most profitable (not necessarily the greatest) animal output from the correct and most efficient use of resource inputs. The distinction between profitable and maximum is key to understanding production medicine. Calves that are fed 1.5 lbs. of dry matter per day grow into bigger, glossier young animals. Calves that are fed 1.2 lbs. of milk replacer on a dry matter basis per day are just as healthy, and start eating calf starter earlier which improves their rumen development. The second option represents a significant savings to the owner-manager, and produces healthy animals with enhanced milk production capacity. The first option places value on maximum output only; the second looks at a larger picture of profitability and represents a production medicine perspective.

### **Production Medicine And The Large Herd**

Production medicine is a concept particularly suited to large herds. In a small herd, the veterinarian works with only one or two people (usually an owner). Success is often achieved because there is keen interest and a direct relationship between the owner's effort and profitability. The large herd, on the other hand, is staffed by more people with diverse interests, different motivation and a wide range of stockmanship capability. Production medicine provides a comprehensive plan to educate, motivate and monitor stockmen and herdsmen. Such a plan is essential for smooth day-to-day operation of the large dairy, and places the veterinarian in a position to be most useful for maximizing dairy profits. In production medicine, the owner/manager and veterinarian each have distinct responsibilities as each relates to farm staff. These need to be clear to both parties so that accountability for success or failure of people or programs is properly identified.

A word of caution: large dairy herds reflect the people who work them, their faults and weaknesses as well as their skills and strengths. The dairy owner/manager and the veterinarian must take into account the range of abilities for understanding and performing when devising programs for people to implement. They must be kept simple if there is a chance that even basic dairy fundamentals will not be achieved. Without the fundamental practices for milking hygiene, animal health and nutrition in place, nothing else can succeed.

### **Structure And Management Of The Large Dairy Herd**

The large dairy enterprise consists of several specialized subunits, each with a particular husbandry and management requirement. A typical division of a dairy's subunits and the farm personnel responsible for them are illustrated in Figure 1.

This specialized management structure groups specific responsibilities for each area and designates the person or team charged with those responsibilities. Besides providing for the smooth run-

ning of an operation, this management system develops accountability. That is, the owner/manager can assign specific responsibilities and performance standards to the person in charge of each unit. The level of performance of the whole dairy is a measure of the combined performance of each of the units.

Typically the owner/manager directs the day-to-day activities of his employees as well as making daily and long-term decisions for the operation. The herdsman may be accountable only for daily animal care and stockmanship, or may be given some management responsibility over milkers, assistants and others. Similarly, the feed manager, replacement herd manager, utility foreman and office superintendent may be assigned specific technical functions or may also supervise any number of farm staff.

The production medicine veterinarian works with farm personnel on large dairies on three levels: 1) directly with the owner/manager, 2) with unit managers, and 3) cow-side staff (Figure 2). Some version of this management format has to exist in order for the large dairy operation to function efficiently. The successful owner/manager can describe his management scheme clearly, employ the right people in key management positions, involve his veterinarian in the appropriate roles and explain to each employee the specific role he or she plays on the dairy's operation. The astute veterinarian will recognize that he has responsibilities to different levels of management, and that the appropriate responses to individual needs (animal and people) will vary depending on management structure and style.

The owner/manager orchestrates the communication and teamwork among key management people. As an example of this process, consider the movement of springing heifers to the close-up pen (replacement herd foreman responsibility). The head count in the close-up pen is now changed (herdsman responsibility) and necessitates a change in the amount of feed to that group of cattle (feed manager responsibility). The owner/manager is responsible for devising communication systems to integrate these activities. Similar coordinated efforts are required to respond to output problems. If several instances of displaced abomasums occur in a week (veterinarian responsibility) and simultaneously production in fresh cows is below targeted standards on test day (herdsman responsibility), these may be clues that addition of a feed component (feeder responsibility) to the fresh cow ration was done suddenly rather than changed gradually over several days (feeder responsibility). Systems exist not only to coordinate everyone's efforts, but to maintain a level of efficiency which maximizes output to the level of greatest profit.

#### **Personnel Management Principles To Maximize Animal Outputs**

When the management structure for the dairy is clear, farm staff can be organized to maximize their productivity and that of the animals in their care. The production medicine veterinarian works closely with the owner/manager to apply four basic management principles adapted from other industries. The object is always to maximize performance from the people and animal resources of the dairy.

**1. Goal setting** — Goals established by the owner/manager for milk production performance are generally meaningless to the cowside farm staff. Rather, specific goals for each unit of the dairy need to be established. When specific goals for each unit are set and achieved, the grand goal for the entire enterprise (whether 24,000 lb. rolling herd average or maximum profitability) is also achieved.

Since goals for output performance of each unit necessarily include maximum health performance, the veterinarian should be involved in setting goals. Ideally, the owner and veterinarian

establish a tentative list of goals for each unit and then solicit feedback from the unit manager. His contributions not only add a touch of reality to the expectations, but it gives the unit manager a sense of ownership in the goals for output expectations from him and the animals he manages. Goals established this way provide farm staff with a sense of job satisfaction when targets are achieved. Figure 3 provides examples of specific goals that could be established for individual units of the dairy.

**2. Establishing programs and training staff** — Farm staff need a plan to accomplish goals. The plan — a program — is a system that directs people to perform specific activities on a routine basis for the maximum benefit of the animals in their care. Programs are very specific action plans, such as the following:

#### Colostrum Delivery Program

1. Immediately after a calf is born, remove one 2-quart bottle of colostrum from the refrigerator and warm it in a pail of hot water.
2. In no less than 1 hour, transport the calf to the next unoccupied calf barn pen.
3. Immediately dip the navel with iodine.
4. Feed the calf 1 bottle of colostrum by sucking from the nipple bottle.
5. If the calf fails to suckle within 10 minutes, use an esophageal feeder to feed the calf 2 quarts of colostrum.
6. Apply an ID tag to the calf's left ear immediately after colostrum feeding.
7. Record all calving and identification information in the fresh cow log after caring for the calf.

This is a very specific action plan for feeding colostrum to newborn calves. When executed properly it will accomplish its objective: to maximize colostral antibody levels in the newborn calf. When done consistently, EVERY calf will have adequate antibody levels. It is specific: there is no interpretation required for knowing how or what to do. It does not deal with how or where to get the colostrum — that is covered in the Colostrum Collection Program. Nor does it deal with subsequent feedings, which is yet another program.

A word of caution: a program combines a PRINCIPLE and a PRACTICE. A principle is an unarguable fact of dairy management; a practice is one of a variety of methods to implement the principle. For example, a milking routine for a mastitis control program is based on the PRINCIPLE of milking clean, dry teats. The PRACTICE to accomplish this may vary: pre-dip teats; wash teats and dry them with a paper towel; avoid any use of water and milk dry teats or use holding pen sprays followed by wiping teats with cloth towels. One of several practices may be chosen to be part of the program. This is the art of successful management — knowing the principles, then knowing how to select from a variety of practices those most appropriate for a particular dairy operation. Programs should be developed for each activity of the dairy unit that affects the output of that unit. The owner/manager and unit manager should jointly author the programs for his area; that assures realistic practices appropriate for the particular staff involved and maintains the owner's priority on profit. The veterinarian is the best resource to identify the animal health principle involved. He can also draw on experiences with other clients to advise which practices may be most effective and suited to that particular dairy.

Dairy employee performance improves when staff know not only what to do, but also why to do it. The veterinarian in a production medicine mode provides the how and why training through demonstrations, one-on-one sessions and group meetings to farm staff. Because programs are only action plans, they can't accomplish goals until they're implemented. Training dairy staff is as crucial as developing the basic program.

3. Monitoring performance — The owner/manager must determine whether the programs are

being implemented by his staff to achieve the output target (i.e., "You can't manage it if you can't measure it.") Monitoring staff performance requires records that measure output. Wherever possible, the records should distinguish between animal output and people performance. While most dairymen use handwritten or computer-generated records on the farm, some areas of the dairy may not be monitored adequately. Under a production medicine agreement, the owner/manager and veterinarian can develop records where none exist, and customize those that are routinely maintained or provided to the dairy (e.g., DHIA) to suit the analysis required. Figure 4 illustrates a variety of records that may be used to monitor a dairy fertility program, as an example.

Whenever data is entered into records, it should include costs and expense/income information when possible. At the least, cost-benefit analyses can help to evaluate effectiveness of particular programs or treatments. Sophisticated bookkeeping systems can integrate these sub-unit analyses with information used to generate periodic profit/loss statements, and generate more precise financial information.

Once records are designed and used in each unit of the dairy, they should be summarized and evaluated periodically. Although time consuming, this is a crucial part of production medicine management. Computer generated reports can be assimilated faster than hand-kept records and lend themselves to graphic display. Graphics bring records to life and are generally preferred by both the owner/manager and staff of large dairies. The veterinarian is usually instrumental in interpreting records, particularly when determining whether animals or staff are responsible for deviations from normal. If, for example, heat detection performance in fresh cows and heifers is unacceptably low, palpation of the reproductive tracts might reveal static ovaries and poor uterine involution (a cow or nutritional problem). On the other hand, palpation might also indicate normal cycling ovaries and good uterine health (thus pointing to personnel failing to observe heat activity, a people performance problem).

Results of record analysis should be compared to the goals established by the owner/manager and unit managers. When records are analyzed jointly by the owner/manager, veterinarian and farm staff, there is more credibility and ownership of the results by the farm staff.

4. Reacting and readjusting performance — The owner/manager has sole responsibility to react in response to the results of periodic record analysis. The veterinarian can play a vital role in developing a reaction strategy with the owner/manager, but he must remember that the job of a production medicine veterinarian is to manage herd health — not the herd or the people employed on the dairy.

Reaction strategy aims at adjusting animal and/or people performance and takes one of two forms: positive response, and reaffirmation of the goals achieved, or negative response with appropriate redirection of efforts and program changes toward goal achievement.

When output goals are achieved, animals in that dairy unit have been well tended, because only then will maximum animal output occur over the long term. The farm staff responsible for achieving those goals require recognition. Acknowledgement of a job well done (positive reinforcement) is the key to future performance. It may take many forms (aside from monetary) but an owner who takes for granted the people who performed well jeopardizes his team. When satisfactory performance goes unrecognized, attitudes of "Why should I care — the boss doesn't" quickly develop. Effective owners/managers make a point of catching their people doing the right thing — and commenting on it.

Underachievement may force changes in a program if poor animal output is to blame. If unacceptable people performance is the cause of underachievement, however, the response should be immediate, specific, definite and conclude with a positive reaffirmation of the goal and the per-

son. In a case of low conception rate due to poor insemination technique, for example, a manager could approach his herdsman like this:

**Immediate**

"John, we just got done looking at last month's first service conception rates and there seems to be a problem."

**Specific**

"Your conception rate was 23%, while Joe's was 48%. Doc says most of his other clients are around 45-50%."

**Definite**

"John, the targets we all agreed to this fall were a 50% conception rate. Last year's records showed that you were above 50% for several months."

**Positive Reinforcement**

"Doc feels that some of the problem may be a bad habit you've developed in your semen handling technique. John, we know you can do well if we can get some glitches worked out. I'd like you and Doc to work together with a reproductive tract that he has to review your techniques. I'm sure you'll get back to your old performance levels again."

Choosing the appropriate reaction strategy is often difficult but a straightforward, businesslike approach is most effective. Managing cows and people at the same time is an art; successful dairy owner/managers integrate their cow sense with keen insight into interpersonal relations when handling their staff. Production medicine veterinarians observe the lines of authority to ensure that supervisors take ownership for problem solving in their units and that appropriate re-training and monitoring takes place.

**Nutrition And Animal Productivity**

The emphasis production medicine places on profitability demands a brief discussion of nutrition. Feed costs generally account for 50% of total annual expenses on large dairies and proper nutrition is crucial to dairy cattle productivity. Controlling feed costs and deciding what and how much to feed can significantly alter total annual expenses and therefore profit from the dairy.

Feed rations must be balanced to meet both nutritional maintenance and production requirements. Nutritional balancing is essential for maximal milk flow, butterfat production, healthy body condition and appropriate growth rates.

Because balancing rations simply for protein, energy and macro elements is no longer sufficient for large successful operations, dairymen need to rely on professional expertise. Trained and experienced nutritionists can balance the ration for micro elements, use by-pass protein and by-pass fat, all while working with the most cost-effective and available feeds. The most valuable nutritionists have, in addition to advanced training and experience feeding dairy cattle, support services available (e.g., laboratory testing of feeds for nutrient analysis and micro-nutrient mixing facilities), and a finger on the pulse of commodity and feed prices. Dairymen can choose a professional nutritionist, a feed company nutritionist or veterinarian who demonstrates the ability to do nutritional consulting. In the first two cases, the veterinarian offering production medicine services is responsible for developing an effective working relationship with the nutritionist because animal health and nutrition are so closely related. A production medicine veterinarian would, for example, tabulate body condition scores, manure consistency and incidence of displaced abomasum and digestive upsets in order to assist the nutritionist in reformulating rations or troubleshooting production problems.

Balancing rations, proper feed mixing and feedbunk management are three crucial areas in feeding cows. The owner/manager of a large herd works with the veterinarian and/or nutritionist to devise specific feeding programs for the feed team. Monitoring animal output and people performance in this program is critical for dairy profitability. Analysis of the feeding program should include calculating actual feed intake routinely (weighing what is fed minus what is left uneaten) to determine if "what is formulated is what is mixed is what is eaten."

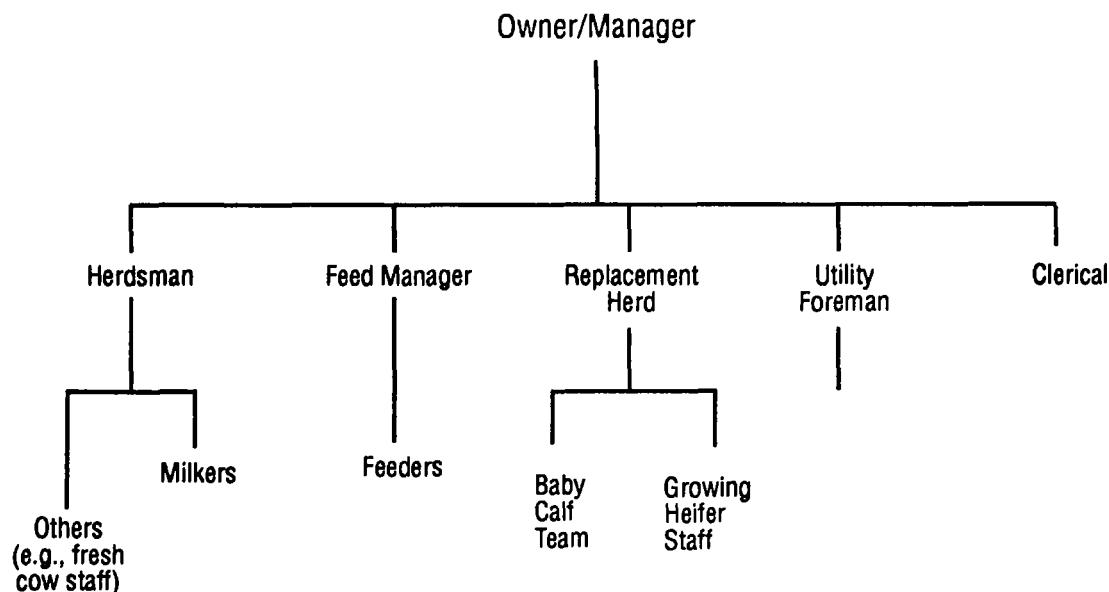
### Summary

Management causes problems by failing to establish clear requirements, and it perpetuates those problems by not setting and maintaining a clear performance standard. Modern large dairy herds are agribusiness enterprises that must adopt commonly accepted management principles from other industries for their operations. When they do, production medicine is the logical approach for incorporating professional veterinary services into the operation. A qualified veterinarian and the dairy owner/manager work together to maximize outputs and profitability by:

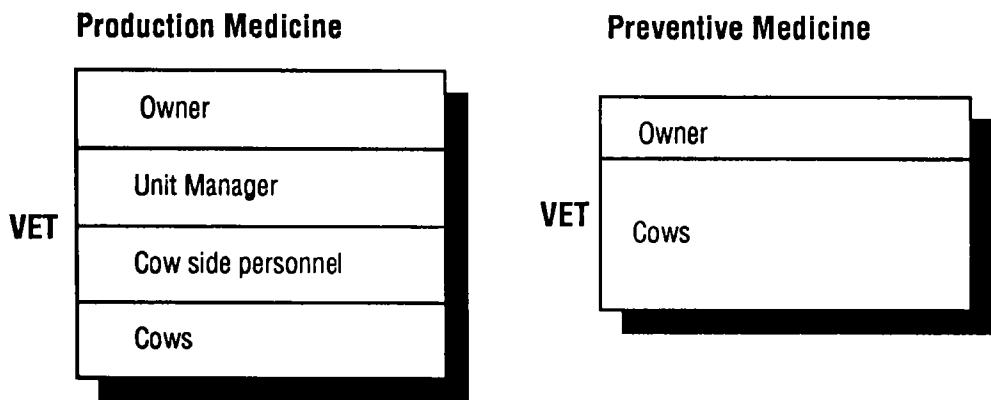
1. Organizing a management scheme.
2. Establishing performance goals for each subunit of the dairy.
3. Providing farm staff with programs and resources to achieve the goals.
4. Monitoring animal and people performance.
5. Responding to performance assessments appropriately.

Production medicine is a professionally rewarding service for the dairy cattle practitioner and an invaluable management asset to the dairy owner/manager who understands and uses it effectively.

**Figure 1: Management Scheme of a Typical Large Dairy.**



**Figure 2: Veterinary Involvement with the Large Dairy.**



**Although both approaches demand veterinary skills, the production medicine mode also requires a wide range of communication skills in order to work effectively with each person on the dairy.**

**Figure 3: Example Goals for Large Dairy Farm Units. (a)**

- |   |   |
|---|---|
| <b>1. Fresh Cow Health (herdsman)</b>   |   |
| difficult or assisted calvings          | <15% of cows  |
| live birth rate                         | <25% of heifers   |
| retain fetal membrane                   | >95% of births  |
| metritis                                | <10% of calvings  |
|   | <20% of calvings at 15 days   |
| <b>2. Fertility (herdsman)</b>          |   |
| heat detection pregnancy % *            | >85% of cows palpated   |
| 24-day trial **                         | >90% of cows evaluated month  |
| cystic ovaries                          | <12% annually   |
| pyometria                               | <0.5% annually  |
| abortions                               | <10% annually   |
| conceptions to 1st service              | >50% in winter months<br>>35% in summer months  |
| calving interval                        | <13 months  |
| services per conception                 | <2.0  |
| DIM to first breeding                   | <70 days  |
| <b>3. Cow Health (herdsman/milkers)</b> |   |
| mastitis/milk quality                   | <200,000 ESCC in bulk tank<br><5,000 SPC in bulk tank<br><0.5% of milking cows withheld for mastitis treatment<br><7 days treatment and w/h per mastitis case |
| milk fever                              | <3% of calvings   |
| ketosis                                 | <3% of calvings   |
| displaced abomasum                      | <0.5% of calvings   |
| mortality                               | <3% annually  |

<b>4. Calf Health (calf foreman)</b>	
mortality	<2% annually
scours	<5% annually
pneumonia	<5% annually
treatment cost	<\$12.00/calf
<b>5. Young Stock (growing heifer foreman)</b>	
mortality	<1% annually
growth rates	standard height/weight charts
<b>6. Milk production (everyone)</b>	
daily production	>70 #/cow/day
daily fat	>3.5 avg./day
rolling herd average	>22,000 lbs. annually
peak milk flow	
-heifers:	>80 lbs
- 2nd lactation:	>100 lbs
- 3+ lactation:	>110 lbs
days in milk	150 days

(a) These figures are offered as examples only and are not complete or accurate for all situations.

(\*: Pregnancy percentages = # of cows palpated pg divided by total # of cows presented for pg examination.)

(\*\*: 24-day trial = # of fresh cows bred within 24 days divided by # of cows identified as eligible to breed over that same 24 day period.)