A Form to Develop Goals for Dairy Production Medicine Programs

Ken Nordlund, *DVM*
School of Veterinary Medicine, University of Wisconsin
2015 Linden Drive West, Madison, WI 53717

Introduction

A production medicine program is a continual search to identify the current limitations of herd production and develop solutions to those problems. The conceptual basis of a production medicine program is dynamic.

Yet the day to day practice of production medicine tends to become static. Dairymen are creatures of habit. Veterinarians are creatures of habit. A production medicine program may begin in some herd with a focus on nutrition as the primary production limiting problem. The problems are identified and a program is designed to solve them. A year later, the nutrition issues may be resolved and the next production opportunity might come from improved udder health. Yet the program has developed its own routine. There is no search for the next opportunity. The process of problem identification and solution that was so dynamic in the beginning has become static. In fact, the program is no longer a production medicine program. It has undergone a regression back to a traditional nutrition program.

Practitioners try to remain active in problem identification by monitoring production records such as DHIA reports on a routine basis. Some veterinarians develop formal written or computerized monitor services by combining data from DHIA records with other records which the dairyman keeps. Herd performance indices are evaluated relative to two points: a target level and an alarm level. By monitoring herd performance on this basis, emerging problems can be addressed early and progress can be measured.

While these principles of monitoring are sound, the process of monitoring is a pointless exercise if the client is not committed to solving problems. A low commitment to problem solving will eventually create a boredom with the monitor efforts. Clearly focused goals, and monitors carefully selected to reflect those goals, are essential to production medicine programs.

Goals in Production Medicine Programs

Mutuality of goals

Effective production medicine programs begin with a mutual commitment by the dairyman and the veterinarian to common goals. As veterinarians, we frequently assume that the goals we desire for our herd programs are the same goals our client has for his dairy. This assumption is a mistake. When we set a somatic cell count goal of 100,000 without the consensus of our client and then proceed to comment on his failure to achieve it, we risk being viewed as an irritating nag. Goals must be clarified and they must be mutual.

Economic expression of goals

One of the problems in establishing compelling goals with clients is that we veterinarians tend to define them in biological terms. We talk about the impact of somatic cells as if they were as clear a threat as hailstones. We speak of the value of a reduced days open as if it were a bale of hay. Yet our clients have not shared our indoctrinations. We can probably create more compelling goals if we define them in economic rather than biological terms.

Prioritized and limited number of goals

Production medicine is an attempt to coordinate and integrate all of the production and health services to a herd. As professionals, we seek thoroughness. However, thoroughness does not require that all problems are addressed at once. In my opinion, we risk attaining nothing when we seek to solve all problems simultaneously. It is the responsibility of a production medicine veterinarian to help prioritize problems, set a few appropriate goals, and develop programs to realize them one at a time. The person with one or two goals will usually achieve them, while the person with 100 goals frequently reaches none.

Many veterinarians confuse a monitor with a goal. A monitor is a device to record, oversee, and critically evaluate a system. Monitors are secondary to goals. Monitors are items we track to help achieve goals. Each monitor item is not, and should not be, a goal.

Monitors with short interval responses

Monitors of progress should be defined so as to respond to changes in a fairly short time. For example, we may be working with a client to reduce the age at which his replacement heifers calve. The goal may be an average age to first calving of 24 months, but "Average Age at First Calving" is not a good index to use to monitor progress in achieving this goal. There is too much lag time between the implementation of management improvements and changes in that index. If heifer nutrition and parasite control programs are implemented today, followed by earlier breeding, it will be a full year before these improvements are reflected in a reduced calving age. A more satisfying index would be "Average Age at First Breeding" or Average Age at Conception" of heifers confirmed pregnant. This monitor would provide positive feedback within a couple months after beginning the program.

Task-responsive monitors

Goals should be stated to directly reflect a very specific task. For example, a herd with reproductive problems due to ineffective heat detection should not use calving interval as a performance monitor. Calving interval will also be affected by voluntary waiting period and conception rates. Instead, an appropriate monitor might be to list the cows eligible to be bred in the next 30 days and track the percentage of this group inseminated.

Opportunity Identification Form

In the summer of 1988, I developed a form to help identify production opportunities and set goals. It was designed to:

1. Be *completed in a discussion with a client.*
2. Utilize the clients records and *his estimates of costs* wherever possible.
3. Provide a *limited economic assessment* of different production problems.
4. Provide a format to *mutually agree on production goals* for the herd.
5. Set the stage to *develop a plan* to accomplish these goals.

The forms requires the three pieces of information: the number of heifers on the farm that have not calved, the girth and height of recently calved heifers, and the DHIA herd summary sheet. It is useful to have a calculator. The form is divided into sections on replacements, udder health, genetics, reproduction, and nutrition. Several sections have been redesigned from the first version to more clearly define opportunities. These sections are followed by an area to summarize areas for attention, goals and a section to describe a working plan. A sample form follows this article.

The form can be critized as being oversimplified as an analytic tool . It is. As I have developed it, I have wrestled with the conflicting issues of analytic precision and practicality. In most veterinary practices and on most dairy farms, an imprecise tool that can be completed will be more effective than a precise analysis that is never done. To be "workable", I believed that it had to depend upon data that was available to most dairymen, the process had to take less than two hours to complete, and the form should not be longer than two pages. I could not produce it in two, but have contained it to three.

1. Replacements

a. Inventory

Replacement issues include appropriate inventory of replacements, their age at first calving, and their size. The inventory of heifers and the age at which they begin milk production are more related to efficiency, whereas size at calving directly relates to production.

The form begins by calculating the number of replacements required by a dairy, based upon herd size, cow culling rates, heifer mortality and culling, and age at first calving.(1) Inadequate numbers of replacements can result from high cow cull rates, extended calving intervals and therefore fewer calves, calf death problems, unusual runs of bull calves, and sales or culls of growing heifers.

Many dairy farms maintain a much larger replacement herd than necessary. If they can sell "springing" heifers at a profit, this may be desirable. However, many dairymen do not know what costs they have in the replacement enterprise and do not know if they make or lose income through this work. Production medicine veterinarians can offer a service of quantifying the replacement heifer rearing costs for each client. The University of Wisconsin Extension Bulletin A2731- Wisconsin Farm Enterprise Budgets: Dairy Cows and Replacements provides a manual format for this analysis. A computerized Lotus spreadsheet (2) to estimate the cost of raising dairy replacements is available from the Food Animal Production Medicine section in the School of Veterinary Medicine at the University of Wisconsin.

b. Calving age of replacements

The form next requests average age at first calving. This index is found on most DHIA summary sheets. The dairyman is asked to put a price per day to maintain two-year old heifers. If the dairyman is reluctant to estimate a cost, asking what he would charge to board his neighbor's heifers will generate a prompt estimate. The cost for maintenance beyond 24 months is estimated. This is a gross opportunity estimate. No effort is made to estimate the alternative costs of growing the heifers at greater growth rates. A partial budgeting approach to look at these alternatives would be appropriate if a new heifer nutrition program becomes part of the action plan.

c. Size of replacements at calving

The next section asks for heart girth and height of recently calved heifers. A chart (3) translating inches to estimated weight follows, along with an estimate of the production impact of additional weight on first lactation yield. The economic consequences are calculated relative to a 1200-1250 pound standard post-calving heifer and are multiplied by the number of heifers calving per year. The section ends with a place for comments about anestrus problems with first lactation heifers, calving paralysis, and the like.

2. Udder Health

The next section focuses on economic losses to mastitis. Mastitis losses are divided into three areas: subclinical losses, subclinical milk price premium losses, and clinical case losses.

a. Production losses due to subclinical mastitis

A table relates herd average somatic cell count linear score to production losses. The calculation that follows is straightforward. This approach is a modification of loss charts (4) that require the average linear score of first lactation and mature cows as separate groups, which would require considerable effort for most farms. The calculation assumes that the first lactation animals constitute one-third of the milking herd.

b. Milk price premiums lost due to high somatic cell counts

Opportunities to generate milk price premiums for lower somatic cell counts are calculated based upon current premiums received versus the maximum offered by the dairy plant.

c. Losses due to clinical mastitis

The next section asks the dairyman to estimate the number of clinical cases of mastitis per year. These cases would include the full range of clinical cases ranging from a simple tube treatment in one quarter to a coliform death. It was unusual for my clients to record this number, and it seems easier to get them to estimate a typical number per month. An annual estimate is made, and the number is multiplied by $163 per case, according to analysis by Michigan State University (5).

3. Genetics

Many veterinarians dismiss genetics, as long as the sires are in artifical insemination. Yet this is a profound mistake for a production medicine advisor. In 1990, it is not difficult to pick two groups of bulls out of the available AI offerings that differ in predicted transmitting ability of dollar value (PTA$) by $150. This means that the daughters of one group of bulls can be expected to produce $150 more milk product per lactation than daughters of the other group. The financial impact of semen selection policy can exceed the impact of most of our health programs and should not be overlooked.

The chart in this section shows the average PTA$ value of sires of different age groups of animals at different production levels in Minnesota. *These data needs to be updated annually.* Each year, new proven higher production bulls are added to the studs, resulting in a typical increase of about 20 PTA$ per year for the population of bulls in AI. Over a longer period of a decade, there will be periodic adjustments of the "base", where the increasing PTA$ indexes are returned to zero.

a. Production losses in cows from lower value AI sires

Potential losses of production are calculated relative to the genetic values being achieved by other high production dairy farms (6). The availability of computerized sire selection programs such as BullSearch (7) and MaxBull (8) has made it possible for veterinarians to aid in identifying high performance sires for their clients.

b. Production losses in cows sired by unproven herd bulls

The section on genetic losses from unidentified sires assumes that the sire is an unproven herd bull. Cassell estimates that an average daughter of the average AI bull will produce $134 more product per lactation than an average daughter of an unproven bull (9). This calculation can stimulate interest in replacement synchronization and AI programs.

4. Reproduction

The section on losses due to reproduction has gone through several changes, and now is based upon a 12-month rolling average of the "average days in milk" (ADIM) *of the lactating cows only.* A rolling 12 month average is needed because seasonally calving herds produce wide swings in ADIM. Western Region Extension Publication 0067- "Evaluating Dairy Herd Reproductive Status Using DHI Records" indicates that herd milk production is reduced 0.17 lbs per cow per day of the year for each day the herd averages over 150 ADIM (10).

I chose to calculate reproduction losses from ADIM rather than the more traditional "calving interval" or "average days open" because such indexes are based upon the successful cows, that is the cows which do become pregnant. These indexes do not include the cows which are ultimately culled for reproductive failure.

5. Nutrition

Peak milk averages serve as indicators of nutrition management. While they are certainly influenced by periparturient health, average peaks serve as excellent monitors of both nutrient adequacy of rations as well as feedbunk management. Other indicators such as "income over feed cost" would be useful, but take considerable time

UNIVERSITY OF WISCONSIN - SCHOOL OF VETERINARY MEDICINE
DAIRY PRODUCTION MEDICINE GOAL FORM - March 1991

CLIENT: ______________________ Date: ______________________

______________________ Vet: ______________________

REPLACEMENTS

INVENTORY: Number of heifers on farm: ________

# cows in herd	Cow culling rate factor	Heifer mortality & culling rates factor	Age at 1st Calf Factor	Required size of replacement herd

$$\_\_\_\_ \times 0.\_\_\_ \times \left(\frac{1}{\left(1 - 0.\_\_\_ \text{ mortality rate}\right)\left(\frac{1}{1 - 0.\_\_\_ \text{ hfr. cull rate}}\right)} \right) \times \left(1 + \left(\frac{\text{avg age, mo.}}{24} \right) \right) = \_\_\_\_$$

Univ.Wis.Ext.Pub. A2731

Shortage or excess of replacement herd: ______________ Actual No. ______ = ______ %

Required ______

ECONOMIC IMPACT OF OVERAGE HEIFERS

Average age at 1st calving: ________

______ x 30 x ______ x ______ = ______________

Mo.> 24 days/mo $/day No. Hfrs/yr $ in increased maintainence costs per year

PRODUCTION IMPACT OF UNDERSIZE HOLSTEIN HEIFERS

SIZE of recent 1st lactation cows		Holstein Target
Heart Girth:	______	77 in.
Withers Height:	______	54 in.

Milk Price per Cwt in Example: $13.50

Heart Girth Inches	Body Wt at Calving (lbs)	1st Lactation Production Differential from 1200 lb Target Wt, Lbs. milk		Gross Loss or Gain per Heifer
<68	<900	-1777		-$240
69	901- 950	-1345		-$182
70	951-1000	-1079		-$146
71.5	1001-1050	-842		-$114
73	1051-1100	-583		-$79
74	1101-1150	-427	<-J.F.	-$58
75.5	1151-1200	-211	Keown,	-$28
77	1201-1250	0	DHMgt,	$0
78	1251-1300	41	Aug.86	$6
79	1301-1350	172		$23
80	1351-1400	212		$29
81	1401-1450	222		$30
>82	>1450	168		$23

______ x ______ = ______________

No. Hfrs per year $ Loss Production loss to undersized heifers per year

REPRODUCTION IMPACT OF UNDERSIZE HEIFERS
(Difficult Calvings, Anestrus, Long Calving Interval)

____

____

Department of Medical Sciences, 2015 Linden Dr. West, Madison, WI 53706 608/263-7600

UDDER HEALTH

PRODUCTION LOSSES DUE TO SUBCLINICAL MASTITIS

Herd Avg. Linear Score	Decrease in milk yield in lbs per cow per lactation (Shook)
0-2	0
3	333
4	666
5	1000

Each increase of 0.1 unit Linear score over 2.0 will decrease milk yield an average of 33 lbs per lactation

________ - 2.0 = ______ x 333 = _______ x ______ = ______________
Herd Avg. Linear Score; lbs/lact.; Lbs lost per cow; No. Cows; Lbs lost for herd per year

________ ÷ 100 x ______ = ______________
Lbs. Lost; $/cwt; $ Lost to Subclinical Mastitis per year

ECONOMIC OPPORTUNITY FROM MILK QUALITY PREMIUMS

Maximum low SCC premium Offered by your milk plant: $ 0. per cwt

Quality premium currently received: $ 0. per cwt

Potential premium difference: $ 0. per cwt

__________ x ______ ÷ 100 x __________ = ____________
Rolling Herd Avg; No. Cows; Potential Prem. Difference; Premium Opportunity for low SCC milk

LOSS FROM ACUTE MASTITIS:

The average mastitis flareup will cost $163 according to Michigan State University in 1988. This will be due to a combination of $20 in medication, $23 in milk discarded, and $120 due to the impact on culling.

__________ x $163 = ____________
Estimated number of mastitis cases per year; $ loss to clinical mastitis per year

GENETICS

Average PTA$ of Sires at Increasing Levels of Herd Production (Minn. DHI, Aug. 1990)

Avg. PTA$,	13,000	16,000	19,000	>22,000	Yours
Service Sires	187	194	202	209	____
1st Lact. Cows	94	112	127	134	____
Other Cows	42	58	75	84	____

PTA$ LOSSES RELATIVE TO TOP PRODUCTION HERDS

Lactation Group	>22,000 PTA$		Yours		PTA$ Diff.		No. Identified Head		
First Lact. Cows	134	-	( )	=	( )	x	( )	=	____
Later Lact. Cows	84	-	( )	=	( )	x	( )	=	____
							Total	=	$____

PTA$ LOSSES IN HERD MEMBERS FROM UNIDENTIFIED SIRES

Lactation Group	Total Number		No. Identified		No. not Identified		Genetic Loss		
First Lact. Cows	( )	-	( )	=	( )	x	$134	=	____
Later Lact. Cows	( )	-	( )	=	( )	x	$134	=	____
							Total		$____

Type traits statistically associated with longevity of dairy cows ranked in order of importance: Udder depth, Teat Placement, Fore Udder Attachment, and Foot Angle.

REPRODUCTION: Average Days in Milk (Lactating Cows ONLY)

Reproduction problems result in cows having extended lactations. The herd average days in milk is very reflective of long term reproductive status of the herd.

Because average days in milk is highly variable in seasonally calving herds, the Average Days in Milk should itself be averaged over the previous 12 month period.

1 ____________
2 ____________
3 ____________
4 ____________
5 ____________
6 ____________
7 ____________
8 ____________
9 ____________
10 ____________
11 ____________
12 ____________

Sum above and divide by 12 = ____________
Rolling ADIM

MILK SALES LOST DUE TO HERD MILKING LATE AND LOWER IN LACTATION CURVE

____________ - 150 x ____________ x .17 ÷ 100 x $_____/cwt x 365 days = ____________
Rolling ADIM — days — Total Cows — lb/day* — $ in milk sales lost per year

* Western Regional Ext. Pub. 0067

CALVING INTERVAL IS DETERMINED BY FOUR FACTORS:

1. Average Days to First Breeding: ____________
2. Heat Detection Rate: ____________
3. Conception Rate: ____________
4. Minimal Abortion and Early Embryonic Deaths: ____________

NUTRITION: PEAK MILK

ECONOMIC IMPACT OF PEAK MILK

4 lb. increased peak = approximately 1000 lbs. during lactation

1,000 lbs milk will usually net about a $55 return to management [Orth: Iowa SU, 1987]

Herd Lactation Avg, Lbs	Peak, 1st Lactation	Peak, Other Cows	Your 1st Lactation Cows	Your Other Cows
22,928	77	100	_____	_____
21,640	74	97	_____	_____
20,848	71	94	_____	_____
19,385	66	89	_____	_____
18,429	63	85	_____	_____
17,435	60	81	_____	_____
16,450	57	77	_____	_____
15,504	55	73	_____	_____
14,506	52	69	_____	_____
13,536	49	65	_____	_____
12,561	47	61	_____	_____

____________ x ____________ x $14/lb = ____________
Increase in Peak Goal — No. Cows — Net — Increased Net for Family or Debt Retirement

FACTORS THAT INFLUENCE PEAKS
Animal: Size, Body Condition, Rumen Adaptation, Calving-time Problems and Diseases, Mastitis, Parasitism
Ration: Palatability, Energy, Protein, Balance
Management: Lead Feeding, Transition Ration, Rate and Degree of Challenge

AREAS FOR ATTENTION

MANAGEMENT GOALS

1. ____
2. ____
3. ____
4. ____

PLANS / NEXT STEP

Department of Medical Sciences, 2015 Linden Dr. West, Madison, WI 53706 608/263-7600

to calculate accurately in most situations, and tends to focus the discussion too closely on input costs and not on overall nutrition mangement.

Because this form is used to shape the conversation, I wanted the last item to shift toward the positive of gains rather than the negative of losses. As such, I structured the economic calculations around "increased net income" from higher peaks. The calculation of increased net comes from the thumb-rule that each additional 4 lbs at peak will increase lactation yield by about 1,000 lbs. Orth (11) reported that each additional 1,000 lbs. of milk yields about $55 per cow per year to management. Therefore, a 1 pound increase at peak should yield about $14 net per cow per year.

A table (12) relating average peak milk to rolling herd average is presented in the form. The client's average peak milk figures are written on to the table. At that time, the discussion must focus on how much improvement in fresh cow nutrition the dairyman and veterinary think is possible. A goal is selected and the projected rewards are calculated.

6. Areas for Attention

The last page of the goal form begins with space for notes. It is a place to jot down the largest loss items and specific comments relative to herd problems. This can be a complete listing of issues, from which a few goals will be produced.

7. Goals

Space is provided to list agreed upon goals. As discussed earlier in this article, they should be few, they should be reflective of specific tasks, and they should be achievable in a modest amount of time.

8. Plans/Next Step

This space is provided to outline a plan to achieve the goals. This is a superb time to outline in broad terms the approach to the identified problems and their solution. It can stand as a written agreement to implement a production medicine program.

Use of the Form

Because completion of the form takes professional time, the time should not be ignored. Because the logical outcome of completion of the form is new or expanded services, part of the time spent is in "service sales" and clients will object to being charged for listening to a "salesman". While the approach to fees for a goal setting exercise will be handled differently by each practitioner, the following comment may be helpful. Because there are benefits to both parties from the exercise, I found it acceptable with clients to track the time spent in the exercise and bill for half.

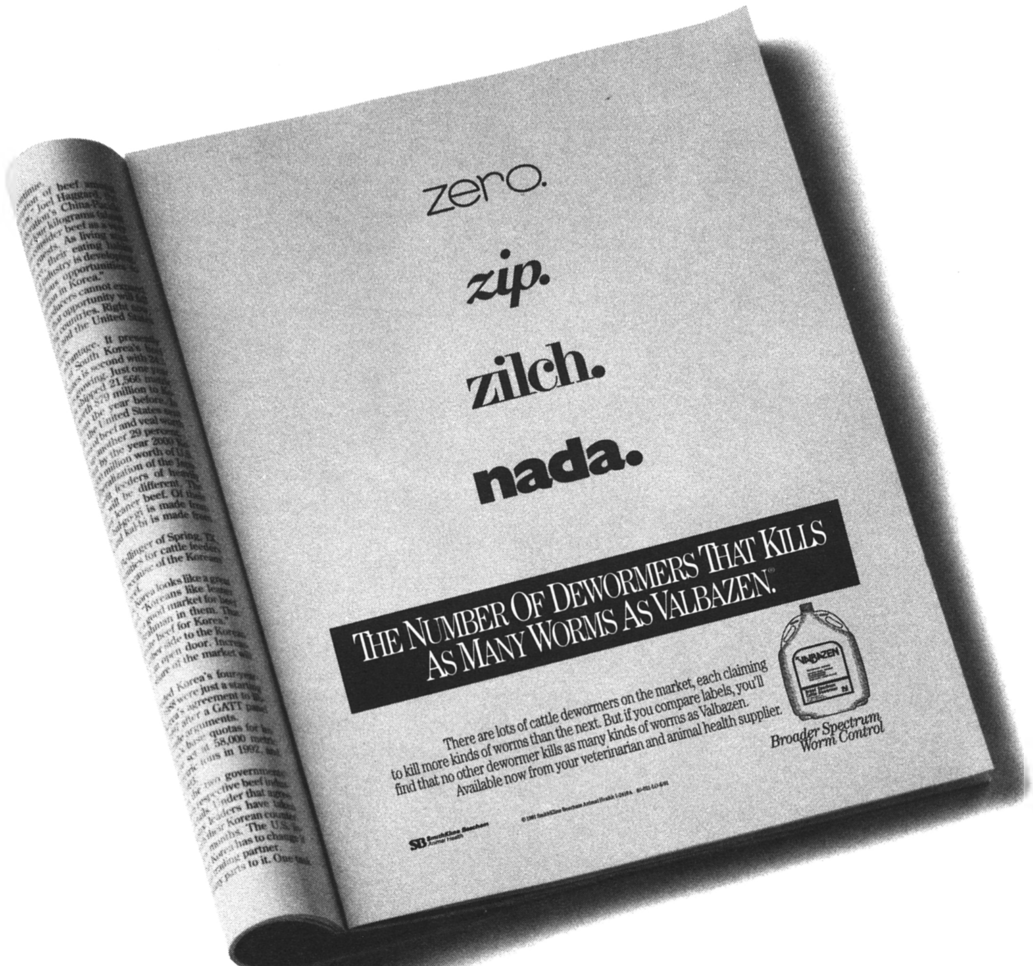
The exercise can be repeated whenever a new overview is justified. However, I believe that an interval of about a year is appropriate.

Summary

Clearly defined goals facilitate the delivery of production medicine programs. Carefully defined monitors that reflect specific tasks and respond in timely fashion can help motivate people to accomplish goals. Time spent with a carefully constructed form to overview major health and production areas can serve as an effective motivator and as a written agreement to address production problems.

References

1. Luening, R.A., Klemme, R.M., and W.T. Howard. Wisconsin Farm Enterprise Budgets: Dairy Cows & Replacements. UW Extension Booklet A2731, 1987. 2. Goodger, W.J., Fetrow, J., et al, "A Computer Spreadsheet Program to Estimate the Cost of Raising Dairy Replacements". Preventive Veterinary Medicine, 7 (1989), pages 239-254. 3. Koewn, J.F., "Freshen Heifers at 1,200 lbs. "Dairy Herd Management, August, 1986, page 18. 4. Reneau, J.K., "Dairy Herd Performance Evaluation: Mastitis Monitors". Proceedings of the American Association of Bovine Pracitioners, No. 18, pages 38-49, April 1986. 5. Kirk, J.H., and P.C. Bartlett. "Economic Impact of Mastitis in Michigan Holstein Dairy Herds Using a Computerized Records System." Agri-Practice, Vol, 9, No. 1, 1988, pages 3-6. 6. Minnesota DHI Scorecard for 1991. Dairy Science Department, University of Minnesota, 1364 Eckles Ave., St. Paul, MN 55108. 7. BullSearch, Holstein Association, 1 Holstein Place, Brattleboro, VT 05302-0808. 8. MaxBull, Cassell, B.G., Department of Dairy Science, Virginia Tech, Blacksburg, VA 24061-0315. 9. Cassell, B.G., "Sell the Bull and Buy Semen". Hoard's Dairyman, January 25, 1991, page 89. 10. Grusenmeyer, D., et al, Evaluating Dairy Herd Reproductive Status Using DHI Records. Western Regional Extension Publication 0067, Washington State University Cooperative Extension. 1983. page 2. 11. Orth, R., "Searching for $ in Your DHIA Records". Dairy. August 10, 1986, page 72. 12. Minnesota DHI Profile. Report from Minnesota DHI Center. 1985. Dairy Science Department, University of Minnesota, 1364 Eckles Ave., St. Paul, MN 55108.



THERE ISN'T A GREAT DEAL MORE TO SAY ABOUT VALBAZEN® EXCEPT THAT NOW IT'S A GREAT DEAL.

Cattlemen in selected parts of the country will soon see this new advertisement for Valbazen. And veterinarians all over the country will soon see why Valbazen now represents an even greater value – for you and your clients. Your SmithKline Beecham sales representative has full details.

SB SmithKline Beecham Animal Health