Udder Health and BST: Is there a Need for Concern?

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"Higher production will hurt the small producer, increase stress and enhance disease". These cliches are not new and have accompanied most major changes in the dairy industry dealing with milk production. They are not all untruths, and many management changes have affected exposure and risk to both metabolic and infectious diseases which challenge our traditional approach to disease control. Understanding the new sciences and using them properly are challenges we must face in our herd health programs. Historically, the elimination of *Streptococcus agalactiae* in a herd has not assured the control of mastitis unless combined with measures to reduce other sources of infections in the herd. Lowering the somatic cell count in a herd results in increased production, but without proper environmental controls, increased clinical mastitis can offset the benefits of reduced subclinical mastitis. Most of our management changes have resulted in improved production, better milk quality or positive cost-benefits ration for the producer. Bovine somatotropin (BST) is the most recent scientific advancement in the industry, offering benefits but sharing concerns as seen in the past. Unlike other new advances, few improvements have received as much publicity or as much scientific research evaluation.

The issue here is not cost-benefit, social effect, or human safety, but whether the use of BST in a herd affects the health of the cow's udder and how does the stress of high production affect udder health? The use of the term "stress" produces a negative image. However, when stress is harmful milk production does not increase, i.e. heat stress reduces production. This is not what has been observed when BST is used.

What effects on udder health were observed in previous research studies? Few of them examined the issue extensively, but monitored general trends in somatic cell count response and clinical mastitis cases. Studies which looked at infection status were often undertaken in small groups of animals, so the response to treatment could be affected by other confounding factors. Such is the case where the number of clinical infections were greater in both control and treatment groups prior to and during the BST trial (Table 1)[10].

Clinical Mastitis for 8 Studies*

	PreTreatment	Treatment	Risk
Controls	35	58	1.66
BST	48	74	1.54
Risk	1.37	1.27	

*Second year excluded from determined risk

In studies where BST was used in high doses of 500 mg/day, the somatic cell count level was higher for the treatment group.[10,12] Franklin, in his masters thesis[4] reported an increase of cell counts from log somatic cell count of 4.91 in controls to 5.18 in cows at 12.5 mg/day. However, numerous other research studies[3,4,6,7,8,9,11,15] have found similar somatic cell counts for BST treatment and controls. Data collection from herds currently under field investigation has shown no differences in somatic cell counts between treated and untreated animals[5].

The number of new infections identified in the summary of field trails in the United Kingdom was greater in the BST group (Table 2).[12] When all studies were summarized, including those in the United States, France, Germany and Netherlands, the risk of new infections was greater for pretreatment with no difference in risk between groups (Table 1).[10,14]

Table 2:

Clinical Mastitis from Experimental and Field Trials in the United Kingdom

Herds	Cows/Group	Control	BST
2 year study	45,30	4	11
3 experiments	46	5	10
6 commercial	224	15	22

(Phipps & Weller, 1988)[12]

In field trails in New York in which the types of infections are being identifed over time, most new infections are minor pathogens of Steptococcus species and Staphylococcal species with low levels of *Staphylococcus aureus* which reflect the major type organisms in the herds. The type of clinical infections have not changed with the use BST. Strep species and coliforms are isolated from most clinical case (Table 3). In this study the level of *Staphylococcus aureus* did not change after the initiation of BST, even though

Table 3.

Type of organism isolated from infected quarters

Infected Quarters	Strep Species	S. aureus	Staph Species	E. coli	Klebsiella
Herd Prevalence(53)	20.7%	3.4%	74.0%	0%	0%
New Infections(58)	19.0%	5.0%	58.6%	13.8%	3.4%
Clinical*(48)	25.0%	6.3%	8.3%	16.7%	4.2%

*40% of clinicals were negative to culture

the treated cows experienced a marked increase in milk production. Those cows with production levels exceeding 30,000 pounds of milk for the lactation had fewer cases of clinical mastitis than the overall herd both prior to and during the use of BST. Thus, even cows exceeding 40,000 pounds of milk which may be considered under production stress did not experience a higher risk of infection.

The effect of BST on *E. coli* mastitis has been investigated by Burvenich in Belgium. His studies suggest that BST may provide a favorable response to therapy and a positive effect on udder health. In their studies[1,2] quarters of cows were infected with E. *coli* and treated with local and systemic antibiotics. The experimental group was given BST in combination with the antibiotic treatment while controls were not. Lactose and lacalbumin levels were measured in the infected and non-infected quarters following treatment (Table 4). Both lactose and lactalbumin were affected less in the infected glands of cows in which BST was used in conjunction with the antibiotic. More significantly the uninfected quarters had no reduction of lactalbumin, a measure of tissue damage, as compared to a 43% reduction for the control cows which suggest a possible protective effect on the non-infected quarters. It was suggested that BST treated animals recovered more rapidly from the disease syndrome[1].

Table 4:

E. coli mastitis treatment with local and systemic antibiotic combined with BST

	Lactose Infected	Lactalbumin Infected	Uninfected
Controls	54%	61%	43%
BST Tx	40%	34%	1%

(Burvenich et al. 1989)[1]

Udder health and risk of new infections have not been completely answered by existing studies.These questions will not be answered until the product has been used and monitored in many commerical operations. Risk factors will vary from dairy to dairy depending on the type of management. Until we see the product used in a variety of dairy operations with both contagious and environment mastitis conditions, we will not know the overall effect of the product. However, it is safe to assume that there is little indication that this management practice will be more harmful than other changes previously made. There is some scientific opinion that the product may actually provide a favorable response in udder health.

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