The Relationship Between Rate of Gain and Implant Response in Suckling Calves

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Story in Brief

The responsiveness of suckling calves to growth promoting implants has long been associated with nutritional status and ability to achieve adequate rates of gain. Using many trials that have been conducted to evaluate the benefit of implants in suckling calves as a data set, the relationship between gain of the calves and responsiveness to implants was evaluated. Fifty steer calf trials and eight heifer trials were used to determine that the relationship between non-implanted control calf gains and response to implants was quite low. Therefore other unknown factors are determining most of the variation in implant response in suckling beef calves.

(Key Words: Beef Cattle, Calves, Implants, Gain Response)

Introduction

Implanting suckling calves with a growth promotant has been considered a profitable practice for cow/calf producers for years. At the time of this printing there are currently three types of growth promoting implants available for use in suckling calves. Several commercially available implants contain 10 mg of estradiol benzoate and 100 mg progesterone; one commercially available product contains 36 mg zeranol as the active ingredient; a third calf implant has 24 mg estadiol 17β (although recent analysis lists this product with 25.7 mg estradiol 17β). All of these products are available for suckling steer calves. Each of the first two types are available and approved for use with suckling heifers.

The response in gain due to implanting is quite variable. It has long been assumed that calves with increased gain had the greater response to the growth promoting implant. This concept can now be evaluated by analyzing the many implant trials reported in scientific literature and field station reports. A recent review of the literature of implant trials of suckling calves (Selk, 1996) has been reported. Each of the trials analyzed had non-implanted control group calves and each trial listed provided the information needed to determine average daily gain of both implanted and non-implanted calves from implant time to weaning. By comparing the average daily gain of the control calves to the response due to implanting, we can measure the importance of gain on the implant response.

Materials and Methods

Research trials that are available in the scientific journals and experiment station reports were compiled into a data set with the results from each trial being considered an equal and independent experimental unit. The data set includes trials that were conducted on steer calves using an estradiol-progesterone implant (Table 1), a zeranol implant (Table 2), or estradiol 17β implant (Table 3). Also data from trials using heifers calves implanted with zeranol (Table 4) were considered as separate data points.

Results and Discussion

The response from implants has been plotted against the average daily gain of non-implanted control calves (Figure 1). Fifty steer calf trials are included as well as eight heifer calf trials. The relationship between daily weight gain and response is not great. The linear regression model with control gain predicting implant response accounts for only 4% of the variation in steer calf implant response. The very low amount of variation in response that was attributed to gain of the calves implies that other factors are involved in determining the effectiveness of implants in suckling calves.

Literature Cited

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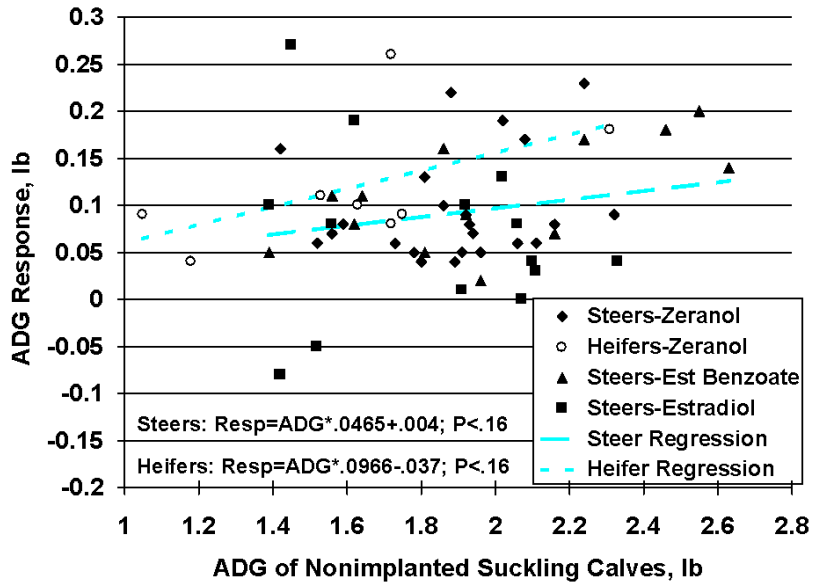

Figure. 1. The impact of average daily gain of suckling steer or heifer calves on the response due to growth promoting implants.

Table 1. Comparison of 36 mg Zeranol implanted once versus non-implanted controls in suckling steer calves.

Study	Control Average daily gain (lb)	Difference in implanted calves
McReynolds et al., 1979	1.42	+.16
McReynolds et al., 1979	1.52	+.06
Simms, 1986	1.89	+.04
Simms, 1986	2.08	+.17
Simms et al., 1986	1.78	+.05
Simms et al., 1983	2.11	+.06
Simms and Schalles, 1984	2.06	+.06
Simms et al., 1983	1.91	+.05
Adams et al., 1991	1.81	+.13
Wardynski et al., 1990	2.02	+.19
Gill et al., 1984	1.59	+.08
Brazle and Whittier, 1988	1.73	+.06
Brazle and Whittier, 1988	1.80	+.04
Brazle and Whittier, 1988	1.88	+.22
Bagley et al., 1989	1.56	+.07
Whittington, 1986	1.93	+.08
Whittington, 1986	1.94	+.07
Whittington, 1986	2.32	+.09
Lamm, 1986	1.92	+.09
Lamm, 1986	2.24	+.23
Lamm, 1986	2.16	+.08
Lamm, 1986	1.86	+.10

Lamm, 1986	1.96	+.05

Table 2. Comparison of 10 mg estradiol benzoate with 100 mg progesterone implanted once versus non-implanted controls in suckling steer calves.

Study	Control Average daily gain (lb)	Difference in implanted calves
Adams et al., 1991	1.81	+.05
Gill et al., 1984	1.62	+.08
Gill et al., 1984	1.56	+.11
Lamm, 1986	1.92	+.09
Lamm, 1986	2.24	+.17
Lamm, 1986	2.16	+.07
Lamm, 1986	1.86	+.16
Lamm, 1986	1.96	+.02
Faulkner et al., 1986	1.39	+.05
Johns et al., 1984	1.64	+.11
Mader et al., 1994	2.63	+.14
Wardynski et al., 1990	2.55	+.20
Wardynski et al., 1990	2.46	+.18

Table 3. Comparison of 24 mg Estradiol 17β implanted calves versus non-

implanted suckling steer calves.		
Study	Control Average daily gain (lb)	Difference in implanted calves
Simms et al., 1983	2.11	+.03
Simms and Schalles, 1984	2.06	+.08
Simms et al., 1983	1.91	+.01
Bagley et al., 1989	1.56	+.08
Lamm et al., 1983	2.33	+.04
Sewell et al., 1986	1.42	-.08
Fontenot et al., 1986	1.52	-.05
Faulkner et al., 1986	1.39	+.10
Wardynski et al., 1990	2.02	+.13
Greathouse, 1986	1.62	+.19
Greathouse, 1986	2.07	0
Whittington, 1986	2.10	+.04
Kuhl, 1982	1.92	+.10
Sawyer et al., 1987	1.45	+.27

Table 4. Comparison of suckling heifer calves once implanted with 36 mg zeranol versus unimplanted calves.		
Study	Control Average daily gain (lb)	Difference in implanted calves

Goerhing et al., 1986	1.63	+.10
Bolze et al., 1984	2.31	+.18
Gill et al., 1984	1.53	+.11
Muncy et al., 1979	1.05	+.09
Brazle and Whittier, 1988	1.72	+.08
Brazle and Whittier, 1988	1.75	+.09
Brazle and Whittier, 1988	1.72	+.26
Faulkner et al., 1986	1.18	+.04

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