

Research Note

PRELIMINARY RESULTS FROM A STUDY AT FARM LEVEL OF THE EFFECT OF ZERANOL IN GROWTH OF SUCKLING BULL CALVES¹

Anabolic agents have been used since the 1950's to improve growth characteristics of cattle for beef production.² In 1962, Stob et al.³ reported on the isolation of an anabolic compound from corn infected with the fungus *Gibberella zeae*. The compound was found to belong to a group of naturally occurring products, the resorcyclic acid lactones. A derivative thereof, zeranol, was prepared and marketed as Ralgro.^{4,5,6} In 1969, Ralgro was approved by the US Food and Drug Administration as an implant for improving rate of growth and feed conversion efficiency in beef cattle. A withdrawal period of 60 days before slaughter was accepted as safe for this implant⁷. Ralgro is presently marketed in Puerto Rico; however, no information has been generated locally regarding its use. The research deals with the first year of a 2-year study at the farm level of the effect of zeranol as a growth promoter in suckling bull calves.

The study was conducted in 1983 at a beef farm located in the area of Yabucoa, in the southeast region of Puerto Rico. Thirty-four intact male calves of the Charbray breed were used. Ralgro pellets, containing 36 mg of zeranol each, were implanted in the ear according to the manufacturer's recommendations at two average initial ages: 60 and 115 days. Duration of the study was 122 days, from April 30 to August 30. Table 1 shows treatment arrangement and number of calves per treatment group. Analysis of variance for growth traits was performed according to the procedures of Snedecor and Cochran.⁸

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² Crighton, D. B., 1980. Endocrinology of meat production. In: Developments in Meat Science-I, R. A. Lawrie, Ed, Pages 1-36. Applied Science Publ.

³ Stob, M., Baldwin, R. S., Tuite, J., Andrews, F. N. and Gillette, K. G., 1962. Isolation of an anabolic, uterotrophic compound from corn infected with *Gibberella zeae*, Nature, 186:1318.

⁴ Ralgro is the commercial name for the implant as manufactured by International Minerals and Chemical Corporation, Terre Haute, Indiana, USA.

⁵ Trade names in this publication are used only to provide specific information. Mention of a trade name does not constitute a warranty of equipment or materials by the Agricultural Experiment Station of the University of Puerto Rico, nor is this mention a statement of preference over other equipment or materials.

⁶ Scott, B. M., 1978. The use of growth promoting implants in beef production, Agric. Dev. Advis. Serv., Q. Rev., 31: 185-216.

⁷ Tindall, B., 1983. Implants and growth promotion, Anim. Nutr. Health. Sept.-October:14-20.

⁸ Snedecor, G. and W. G. Cochran, 1967. Statistical Methods. 6th ed, Iowa State University Press, Ames, Iowa.

There were no significant differences in mean initial liveweights between treatments within age groups (60 and 115 days). Ralgro-treated animals weighed 82 vs. 79 kg for the controls at 60 days, and 118 vs. 114 kg, respectively at 115 days. After 122 days, the implanted calves averaged 11 kg more than the controls ($P > .05$), or a 6% difference in liveweight (table 2). Calves implanted when 60 days old responded better to the anabolic treatments (21 kg over controls) than the 115-day-old calves (8-kg difference). However, these differences were not statistically significant.

TABLE 1.—*Treatments arrangement and number of calves per treatment group*

Initial age	Treatments		Total number
	Ralgro	Control	
60 days	8	6	14
115 days	10	10	20
Total number	18	16	34

TABLE 2.—*Average liveweights at the end of the trial (122 days)*

Initial age	Treatments		Implanted over control	Significance level ¹
	Ralgro	Control		
	<i>kg</i>		<i>kg</i>	
60 days	174	153	21	NS
115 days	209	201	8	NS
General mean ± SD	194 ± 37	183 ± 36		
Implanted over control	11 (6%) ²			

¹ Within age group.

² Difference statistically not significant ($P > .05$).

Implanted calves gained 92.1 kg (.75 kg/day) and controls gained 82.3 kg (.67 kg/day) in liveweight over the entire trial (122 days). The difference in favor of the anabolic treatment (9.8 kg or 12%) was nonsignificant (table 3). Calves implanted at 60 days grew at the same rate as those implanted at 115 days (92.6 and 91.7 kg, respectively). The response to the anabolic treatment relative to the controls was greater, however, in the younger calves (19.1 kg difference) than in the older ones (4.1 kg). Neither differences between treatments within age groups nor the interaction between treatments and age groups was significant ($P > .05$).

The recommendation of the manufacturer of the implant and related research⁷ establishes that the effectiveness of the anabolic treatment

lasts approximately 90 days after implantation. Therefore, the increments in liveweight up to 82 days of the trial were analyzed (table 4). The general pattern observed over the entire period of study had already been established at 82 days. The advantage of the implanted calves over the controls (9.8 kg or 17%) was significant ($P < .05$) at this time, because of the contribution made by the younger calves, whose difference (18.6 kg) was also significant ($P < .05$). Less variation in liveweight increases

TABLE 3.—Total and average daily liveweight gains during the trial (122 days)

Initial age	Treatments		Implanted over control	Significance level ¹
	Ralgro	Control		
	<i>kg</i>		<i>kg</i>	
60 days	92.6	73.5	19.1	NS
115 days	91.7	87.6	4.1	NS
General mean \pm SD	92.1 \pm 20.6	82.3 \pm 18.2		
Implanted over control	9.8 (12%) ²			
Average daily gain, kg/day	.75	.67		

¹ Within age group.

² Difference statistically not significant ($P > .05$).

TABLE 4.—Average increment in liveweight up to 82 days of the trial

Initial age	Treatments		Implanted over control	Significance level ¹
	Ralgro	Control		
60 days	66.6	48.0	18.6	$P = .05$
115 days	66.1	61.6	4.5	NS
General mean \pm SD	66.3 \pm 14.4	56.5 \pm 13.1		
Implanted over control	9.8 (17%) ²			

¹ Within age group.

² Difference statistically significant ($P < .05$).

within this age group was probably responsible for significance of the difference at 82 days, since the magnitude of the difference was similar at both intervals (tables 3 and 4). Nevertheless, if this finding is confirmed, the possibility arises of reimplantation at 90 days, which might permit a continued stimulus to weight gains until weaning in calves first implanted at an early age.

The study will be repeated a second year in order to increase the number of observations. Preliminary conclusions from the first year:

1. A positive effect of zeranol implants upon growth of suckling bull calves was detected. Treated calves weighed on the average 11 kg or 6% more than controls at the end of the trial (122 days).

2. A significant difference (9.8 kg) in liveweight increase at 82 days was found between implanted calves and controls.

3. Calves implanted at 60 days of age responded better to the anabolic treatment than those implanted at 115 days. These findings are tentative because of the small number of animals involved, especially in the younger group.

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