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Nov 22 '60

T. DONALD BELL  
J. J. DAHMEN  
WADE WELLS

IDAHO Agricultural  
Experiment Station

Bulletin 334  
August 1960

Stilbestrol implants are classed as "food additives." As such their use comes under the jurisdiction of the Federal Food and Drug Administration. Permits for their manufacture and sale have been issued to drug companies. Dosages and conditions for their use are specified and must be followed by the user to comply with the regulations.

The producer is responsible for following the label specifications or instructions to comply with the regulations and limitations of the Pure Food and Drug laws.

# The Performance of Steers on Pasture and in the Feedlot as Affected by Stilbestrol Implants

T. DONALD BELL, J. J. DAHMEN, AND WADE WELLS\*

**D**IETHYLSTILBESTROL, more commonly known as stilbestrol, has been fed in steer fattening rations by a large number of feeders since 1954. Implants of stilbestrol have also been widely used by cattle feeders for the past several years.

Radabaugh and Embry (1) in 1959 summarized the results from the reported experiments of the various experimental stations. They found that steers on fattening rations fed stilbestrol orally gained an average of 14.3 percent faster in 92 trials than similar control steers. Stilbestrol-implanted steers on fattening rations gained 14.2 percent more than similar non-implanted steers in 63 trials.

Less information is available concerning the value of stilbestrol implants in steer wintering rations and for steers on pasture, as well as the effect of implanting during the winter or on pasture upon subsequent feedlot gains. Kircher (2), Harvey *et al.* (3), Smith *et al.* (4) and Radabaugh and Embry (5) have reported increased steer gains on pasture through the use of stilbestrol implants. Kercher (6), Thompson and Kercher (7), Radabaugh and Embry (5), and England (8) have reported that steers implanted with stilbestrol during the summer pasturing period gained as well in the feedlot as those that were not implanted. The effects of implanting during the wintering period upon subsequent pasture gains have not been consistent (4) (5).

Because of the limited information available concerning the use of the implants under Idaho conditions, cooperative studies were initiated in 1957 with cattlemen in Idaho and Washington to determine the value of stilbestrol implants in their feeding and grazing programs. The studies had the following objectives:

1. To determine the value of stilbestrol implants in the wintering rations of yearling steers and steer calves that were to be pastured the following summer and fattened in the dry lot the following fall.

\*Head, Department of Animal Husbandry; Superintendent, Caldwell Branch Experiment Station; and Animal Husbandry Extension Specialist, respectively.

2. To determine the effect of stilbestrol implants upon summer pasture gains and fall feeder grades of yearling steers, steer calves, and suckling calves still with their mothers.

3. To determine the effect of previous implantation upon subsequent performance on pasture and in the feedlot.

## Wintering Studies

The effects of the implants upon winter gains were studied with six different groups of weaner calves totaling 438 head and with 336 head of yearlings, belonging to one cooperator. The calves in the trials weighed approximately 400 pounds at the start of the tests and the older steers weighed approximately 700 pounds. The steers in each experimental group were individually identified with ear tags and divided at random into two groups. The steers in one group were implanted with stilbestrol while those in the other were not implanted and served as controls. The calves in five of the tests received one 12 mg. implant of stilbestrol and the yearlings and calves in one of the tests each received two 12 mg. implants. Implanting was done under the skin of the ear. The steers were fed wintering rations consisting largely of hay and silage with a limited amount of grain or protein supplement. Individual weights were taken at the beginning of the wintering period and at the end of the tests. The comparative rates of gain for the implanted and non-implanted cattle are shown in Table 1.

It will be seen from the table that the implants increased the average daily gains in all of the tests, but the amount of increase was not statistically significant in Calf Tests 3, 5, and 6. There appeared to be no consistent relationship between initial size and effect of implanting nor between type of ration and response to the implants.

## Pasturing Studies

Some 400 calves, 600 yearlings, and 50 suckling calves were included in the pasturing studies. The comparative rates of gain of the implanted and non-implanted groups are shown in Table 2. In most of the tests, feeder grades were estimated by experienced graders at the end of the grazing periods. Numerical values were assigned to the grades so that averages could be determined for the treated and untreated groups. These averages are given in Table 2. The numerical values assigned to the various grades were as follows:

High choice .....	12
Middle choice .....	11
Low choice .....	10
High good .....	9

Table 1. Effect of stilbestrol implants upon winter gains of calves and yearlings.

Test No.	No. of cattle	No. of days on test	Av. Weight		Size of implant	Average daily gain of implanted cattle	Average daily gain of cattle that were not implanted (controls)
			Initial	Final			
			lb.	lb.			
Calves							
1	200	116	430	572	24 mg.	1.30**	1.13
2	50	55	375	405	12 mg.	.66*	.43
3	50	55	362	407	12 mg.	.84	.80
4	38	145	448	609	12 mg.	1.22*	1.00
5	55	142	390	492	12 mg.	.78	.67
6	45	139	331	421	12 mg.	.65	.64
Total & Averages	438		402	512		1.03	.89
Yearlings							
1	336	145	686	764	24 mg.	.63*	.46

\* Significantly greater than controls at 5 percent level of probability.

\*\* Significantly greater than controls at 1 percent level of probability.

Table 2. Effect of stilbestrol implant upon the gains and feeder grades of yearling steers, steer calves, and suckling steer calves during the summer grazing period.

Test No.	No. of steers in test	No. of days on test	Av. Weight		Implanted cattle		Control cattle	
			Initial	Final	Av. daily gain	Fall feeder grade	Av. daily gain	Fall feeder grade
			lb.	lb.	lb.		lb.	
Calves (12 mg.)								
1	50	56	405	507	1.96*		1.68	
2	50	56	407	509	1.94*		1.67	
3	200	175	572	833	1.53*	8.57	1.46	8.81
4	38	118	609	817	1.86*	8.30	1.65	7.00
5	52	126	492	728	1.84	8.16	1.72	8.74
Total & Averages	390		522	734	1.71	8.46	1.57	8.57
Yearlings (24 mg.)								
1								
Heavy	100	54	820	958	2.88**		2.22	
Medium	100	86	730	933	2.50**		2.22	
Light	98	86	625	816	2.44**		1.99	
2	320	115	763	1001	2.24**	8.20	1.84	7.84
Total & Averages	618		745	954	2.42	8.20	1.99	7.84
Suckling Calves (12 mg.)								
	50	181	193	446	1.53**	9.69	1.27	8.96

\* Significantly greater than controls at 5 percent level of probability.

\*\* Significantly greater than controls at 1 percent level of probability.

Middle good .....	8
Low good .....	7
High medium .....	6
Middle medium .....	5
Low medium .....	4

Tests 1 and 2 with calves were conducted in the Ellensburg, Washington, area on typical spring-fall ranges.

The remaining tests were conducted in Idaho during the normal summer grazing season and upon private summer pastures in the McCall and Fairfield areas. The suckling calves ran with their mothers in the Bear Valley area on the Boise National Forest.

It will be seen from Table 2 that in every test the average gain for the implanted cattle was larger than the average gain of the non-implanted controls. The greatest response in gain to the implants was shown in the yearlings where the increased rates of gain ranged from .28 pound up to .66 pound per head per day in favor of the implanted steers. In the one test with suckling calves those implanted gained 1.53 pounds per head per day compared to 1.27 pounds per head per day for the calves that were not implanted.

Response of the steer calves (short-yearlings) varied and the average daily gain of the implanted steers above those not implanted ranged from .07 pound up to .28 pound per head per day.

There has been some concern about the effect of the implants upon the appearance and feeder grade of the treated cattle. Many people, including buyers and growers, feel that the hormone implants lower the quality of the animals and that the implanted cattle can be recognized by their high tail heads and their rough "hippy" appearance. These opinions were not borne out by these tests and it will be seen from the average grades for the different groups of cattle reported in Table 2 that the implanted cattle generally graded slightly higher than those that were not implanted.

## Effect of Previous Implanting Upon Summer Gain

Cattlemen are naturally concerned about the possible effect of implanting during the wintering period upon the subsequent summer gain. Tests with three groups of yearlings are summarized in Table 3. These are some of the same cattle that were included in the previous section on "Pasturing Studies" and the results are presented in more detail to show the effect of previous implanting upon the gains the following summer.

Table 3 shows that implanting during the winter had no consistent effect upon the gains the following summer of either those that were re-implanted on pasture or those which were not re-implanted. The gains of the summer-implanted cattle that had not

Table 3. Effect of implanting during the wintering period upon the subsequent summer pasture gains of calves and yearlings.

	No. of steers in test	Average initial weight	Days on test	Average daily gain of cattle implanted beginning of summer grazing period	Average daily gain of cattle not implanted during grazing period
		lb.		lb.	lb.
Calves (Short-yearlings)					
Test 1					
No winter implant	100	569	175	1.54	1.52
Previous winter implant	100	575	175	1.51	1.40
Test 2					
No winter implant	19	596	118	1.83	1.60
Previous winter implant	19	624	118	1.88	1.71
Test 3					
No winter implant	27	503	126	1.89	1.77
Previous winter implant	25	482	126	1.78	1.68
Yearlings					
Previous winter implant	150	766	115	2.22	1.87
No previous implant	170	761	115	2.26	1.82



Table 4. Feedlot gains as affected by previous implantation with stilbestrol.

	No. of cattle	Av. daily gains of controls (no feed lot implants) lb.	Days in feed lot	Av. finish grades	Av. daily gains of steers implanted when placed in feed lot (36 mg.) lb.	Av. finish grades
No previous implants	50	2.18	98	8.85	2.69	9.30
Implants previous winter (24 mg.)	50	2.28	98	9.38	2.69	9.68
Implants previous summer (24 mg.)	50	2.31	98	9.18	2.76	9.50
Implants both previous winter and previous summer	50	2.30	98	9.15	2.77	10.00

been previously implanted during the winter were slightly larger in three of the groups and slightly less in one of the test groups than the gains of those that had not been previously implanted.

The average daily gains of the summer controls (cattle not implanted on pasture) that received the winter implants were slightly larger in two of the test groups and slightly less in two of the groups than the gain of those that had not been previously implanted.

## **Effect of Previous Implantation Upon Subsequent Feedlot Performance**

Many cattle feeders and feeder buyers in the western part of the United States feel that previously-implanted cattle will not do as well in the feedlot as those that have not been previously implanted, and, consequently, will not pay as much for them.

Four groups totaling 200 head of cattle were followed through the wintering, pasturing, and feedlot phases to study the effect of previous implanting upon the feedlot gains and final grades. The average daily gains for the different groups and the average slaughter grades estimated by a committee of three experienced graders are shown in Table 4.

It will be seen from Table 4 that previous implanting had little effect upon the feedlot gain of steers that were re-implanted in the feedlot or steers that served as controls and were not implanted. In fact, the small differences in rates of gain were in favor of the previously-implanted cattle. Neither was there a great deal of difference in the estimated slaughter grades of the previously-implanted cattle and those that had not been previously implanted — and again the slight differences were in favor of the cattle that had been previously implanted.

### **Summary**

Cooperative studies were conducted with cattlemen in Idaho and Washington to determine the value of stilbestrol implants in the wintering, grazing, and finishing phases of their cattle feeding programs.

In virtually all of the tests, the winter gains of steer calves and yearling steers fed a ration consisting largely of roughage with a small amount of concentrate were increased when stilbestrol implants were given at the beginning of the wintering period. The customary dose for the calves was a single 12 mg. implant and the

customary dose for the yearlings was two 12 mg. implants. Increased average rates of gain for the implanted calves ranged from .01 pound per head per day up to .23 pound per head per day. The implanted yearlings gained an average of .17 pound more per day than the steers that were not implanted.

Summer pasture gains were increased in all of the tests by the hormone implantation. The greatest response was shown in heavy, long yearling steers where the implanted cattle gained an average of .66 pound more per day than those that were not implanted. The response of the calves (short-yearlings) was smaller and more variable — the difference in favor of the implanted calves ranging from .02 pound per day up to .28 pound. Implanted suckling calves gained .26 pound per day per head more than suckling calves that were not implanted.

Previous implanting during the wintering had no consistent effect upon the subsequent summer gains on pasture — either when the steers were re-implanted or were not implanted on pasture. Previous implantation, either during the wintering period or pasturing period, had little effect upon the subsequent cattle response to stilbestrol implantation in the feedlot, nor did previous implantation affect the feedlot gains of those cattle that were not re-implanted.

Feeder and slaughter grades were not consistently affected by hormone implantation. There was a tendency, however, for the implanted cattle that made the larger gains on pasture or in the feedlot to grade a little higher than the cattle that were not implanted.

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## Acknowledgements

The studies reported in this bulletin were supported by financial grants from Chas. Pfizer and Company, who also provided the stilbestrol implants (stimplants) used in the tests.

The following cattlemen furnished cattle and cooperated in securing the experimental data:

Ernest, Wesley and Bob Fields of Gooding and Fairfield, Idaho  
William Eld of Donnelly, Idaho  
Frank and Art Hall of Donnelly, Idaho  
Matt and August Koskella of Donnelly, Idaho  
LaVaughn and Dorsey Hewick of Donnelly, Idaho  
Ray Kesgard of Emmett, Idaho  
Howard Manley of Ellensburg, Washington

The following county agents supervised the trials and assisted in collecting the data:

Don Greenwell of Valley County  
Edward Koester of Gooding County  
Erling Johannsen of Gem County

Ralph Olmstead, cattle feeder at Twin Falls, and Joe Ostler, of the Ostler Livestock Company at Caldwell, assisted in grading the experimental cattle.

Dr. Ross Christian, of the Animal Husbandry Department in the Idaho Experiment Station, was helpful in the statistical analyses of the data; and Dr. C. W. Hodgson, of the Animal Husbandry Department in the Idaho Agricultural Experiment Station, was helpful in preparing this publication.