Economic Evaluation of the Use of Feedlot Abortifacients

Alvin J. Edwards, *D.V.M., PhD.*
Feedlot Specialist
College of Veterinary Medicine
Kansas State University
Manhattan, Kansas 66506
Scott B. Laudert, *PhD.*
Extension Livestock Specialist
Kansas State University
Garden City, Kansas 68746

Summary

A total of 169 head of pregnant heifers were divided into a control group where no abortifacients were used and a treatment group where abortifacients were administered. The heifers were re-examined after 21 days, and 14% of the control group had spontaneously aborted compared to 95% of the treatment group. After a 105-day feeding period, the heifers were slaughtered and 44% of the control group were pregnant with only 4% of the treatment group pregnant. Carcass data from the two groups revealed an economic advantage of $17 per head for the aborted heifers over the controls.

Introduction

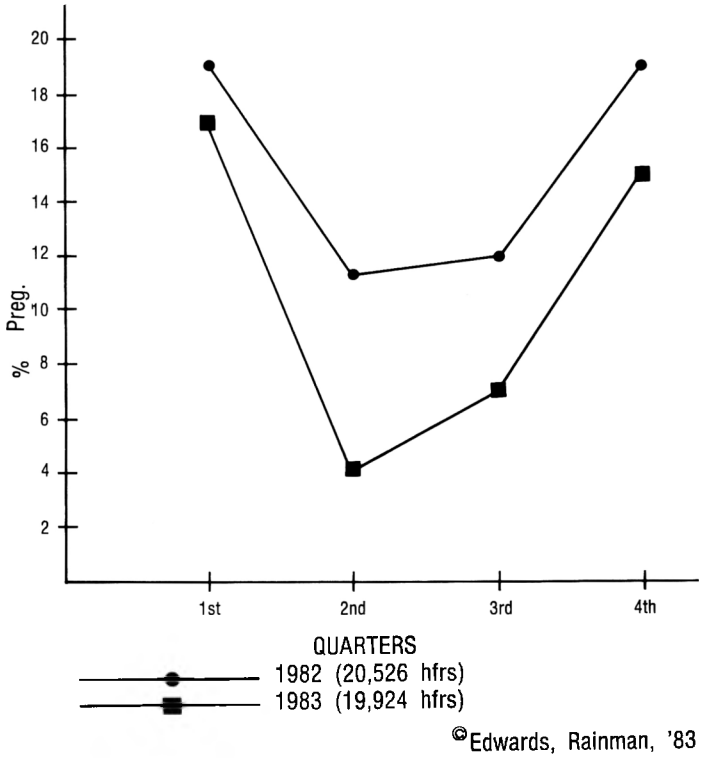
Pregnant heifers entering the feedyard are recognized as a liability to the cattle feeder. Economic losses occur as the result of death at calving, increased treatment costs, additional labor cost to check and calve-out pregnant heifers, and reduced value when sold. The incidence of pregnant heifers entering a feedlot can be quite variable depending on the season and source of the heifers. Figure 1 graphs the incidence in one feedlot where incoming heifers have been pregnancy examined and accurate records are maintained. In 1982, 15% of those examined were pregnant compared to 9% for 1983. The seasonal variation is quite similar for the two years with the highest incidence occurring during the late winter and early spring months.

The objectives of this trial were to evaluate the economics, safety, and efficacy of using Lutalyse®, Estrumate®, and Bovilene® as abortifacients in feedlot heifers less than 120 days pregnant and these same products in combination with 20 mg of Dexamethasone in those exceeding 120 days pregnant.

Materials and Methods

Heifers were pregnancy examined upon arrival at a commercial feedyard. The heifers originated from three sources and were delivered to the feedyard over an 11-day period. Those palpated as pregnant were individually identified and penned until 174 were accumulated. A receiving ration without MGA was fed until the last heifers were added to the pen, and then a typical sequence of feedyard finishing rations was initiated. Twenty-one days after the last pregnant heifers were identified, all heifers were re-examined by palpation and month of pregnancy determined. At this time the heifers were randomly assigned to equal numbers of a control or aborted treatment group as they came through the chute. Equal numbers of heifers in the treatment group diagnosed as being less than 120 days

FIGURE 1. Incidence of Pregnancy in Incoming Feedlot Heifers by Quarters 1982, 1983



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pregnant were injected with the manufacturers' recommended dosage of Bovilene, Estrumate, or Lutalyse. Equal numbers of heifers in the treatment group diagnosed as being more than 120 days pregnant were injected with the manufacturers' recommended dosage of Bovilene, Estrumate, or Lutalyse plus 20 mg of Dexamethasone. Control heifers were not injected. All heifers were palpated 20 days following treatment to determine abortifacient efficacy.

The control and aborted groups were fed in equal-sized pens on opposite sides of the feed alley. Each heifer was individually weighed at the beginning and end of the trial. All heifers were slaughtered, and those still pregnant were identified. Carcass data collected included carcass weight and USDA yield and quality grade. Feedlot performance and carcass data were analyzed by least squares analysis of variance with starting weight held constant.

Results

Five of the initial 174 heifers were detected open when the heifers were re-examined 21 days after identification and were not included in the trial. Pregnancy status 20 days post-treatment for remaining heifers is reported in Table 1. Fourteen percent of the control heifers had spontaneously aborted prior to this time. Responses to the abortifacients were good to excellent at this time (85-100%).

TABLE 1. Pregnancy status 20 days following treatment with or without abortifacients.

Treatment	Number Heifers	Days Pregnant	Number Aborted	Percent Aborted
Control	85	90-240	12	14
Bovilene	14	120	14	100
Estrumate	14	120	13	93
Lutalyse	13	120	11	85
Bov + Dex	15	120	14*	100
Est + Dex	14	120	14	100
Lut + Dex	14	120	13	93

* One heifer died calving on Day 5.

Average starting weight of the 161 heifers completing the 105-day trial was 720 lbs. Two heifers in the control group died calving, and two were removed for reasons unrelated to the trial design. Three heifers in the treated group died, one calving and two from causes unrelated to the trial design.

Feedlot performance of the heifers administered abortifacients is reported in Table 2. Heifers aborted when less than 120 days pregnant gained 17% faster ($P<.05$), 1.98 vs 1.69 lb per day, than heifers aborted when more than 120 days pregnant. Differences in fetal and fluid weight loss associated with time of abortion could account for half of the gain difference observed. The additional reduction in performance may have resulted from stresses of aborting a larger fetus and associated complications such as retained placenta and metritis. Final live weight, carcass weight, and yield grade were all influenced by the poorer performance of the late-abortion heifers. Dressing percent and quality grade were not affected by stage of pregnancy when aborted.

TABLE 2. Performance of heifers aborted during early and late gestation.

Item	Aborted at 120 days or less	Aborted at 120 days of more
Number	38	40
Final Weight	914	883
Carcass Weight	568	545
Daily Gain	1.98[a]	1.69[b]
Dressing Percent	62.2	61.6
Yield Grade	2.4[a]	2.1[b]
Percent Choice	55.3	60.0
Months Pregnant[c]	3.3	5.3

[a, b] Means with different superscripts differ, $P<.05$.
[c] Average months pregnant when aborted.

At slaughter, 36 (44%) of the control heifers and three of the treated heifers were pregnant. These were pooled in the analysis to represent the pregnant group., Seven of the control heifers calved shortly before slaughter as determined being identified at calving or by enlarged uteri on the eviscration table at slaughter and were kept separate for analysis purposes. The remaining heifers were pooled to represent open heifers in the data analysis. Results of open, pregnant, and recently calved heifers are reported in Table 3. Recently calved heifers had significantly ($P<.01$) lower final live weight, carcass weight, and daily gain than either the open or pregnant heifers. These data clearly indicate that in addition to the death loss associated with calving feedlot heifers (2.4% of the heifers calving died calving), sale weight is dramatically affected unless the feeding period is extended. Even then a considerable number of additional days would be required to obtain a desirable slaughter weight.

Pregnant heifers, Table 3, gained 15% faster ($P<.05$), 2.17 vs 1.89 lb/day, than the open heifers. This amounted to an additional 28 lbs ($P<.05$) of slaughter weight; however, carcass weight of the pregnant heifers was 20 lbs ($P<.05$)

TABLE 3. Feedlot performance of aborted, pregnant and recently calved heifers.

Item	Reproductive State at Slaughter		
	Open	Pregnant	Recently Calved
Number	115	39	7
Final Weight	919[A]	947[B]	805[C]
Carcass Weight	566[A]	546[B]	476[C]
Daily Gain	1.89[A]	2.17[B]	0.82[C]
Dressing Percent	61.6[A]	57.6[B]	59.2[C]
Yield Grade	2.3[A]	2.6[B]	2.3[AB]
Percent Choice	59	72	71

ABC $P<.01$

less. Dressing percentage decreased from 61.6% to 57.6% for the open and pregnant heifers, respectively. The combined result of a 4.0% reduction in dressing percentage and 20 lb reduction in carcass weight is equivalent to 0.31 lb per day slower live weight gain in the pregnant heifers if an assumed dressing percentage equal to the open heifers is used. From these data it would appear the fetal growth in pregnant feedlot heifers has a high demand for nutrients. It is also possible that large feti limit capacity for feed intake, thus further reducing the availability of nutrients for carcass weight gain.

The performance data from the 39 heifers pregnant at slaughter are presented in Table 4. As stage of pregnancy increased, dressing percentage decreased linearly ($P < .05$). Although daily gain was not different, carcass weight tended to decrease as stage of pregnancy increased.

TABLE 4. Performance of heifers pregnant at slaughter.

	Months Pregnant at Beginning of Trial				
Item	**2**	**3**	**4**	**5**	**6**
Number	3	13	12	8	3
Final Weight	912	954	932	973	950
Carcass Weight	530^{AB}	560^{A}	534^{B}	553^{AB}	521^{AB}
Daily Gain	1.82	2.22	2.01	2.41	2.20
Dressing Percent	57.9^{AB}	58.7^{A}	57.4^{AB}	56.9^{BC}	55.0^{C}

ABC Means on the same line differ $P < .05$.

TABLE 5. Economic Advantage of Aborting Feedlot Heifers[a].

	Non-aborted	Aborted
Number Heifers	100	100
Pregnant Initially, %	100	100
Pregnant at Slaughter, %	44	4
Open at Slaughter, %	48	96
Recently Calved, %	8	0
Slaughter Weight	1004	1001
Dressing Percentage	59.6	61.4
Carcass Weight	598	615
Slaughter Value, $[b]	598	615
Advantage per head, $	—	17

[a] Based on data reported in table 3 and slaughter weight of 1000 lbs for open heifers.
[b] Carcass value of $100/hundredweight.

The estimated economic advantage of aborting feedlot heifers based on data generated from this study is presented in Table 5. For every 100 pregnant heifers entering the feedyard, 44 would be marketed pregnant, 48 open, and 8 recently calved if abortifacients were not used. Ninety-six percent of the aborted heifers were open at slaughter. Slaughter weight of the heifers in each group is estimated assuming a 1000 lb slaughter weight for open heifers and adjustments made based on numbers pregnant, open, or recently calved. Heifers aborted when entering the feedyard are estimated to gross $17 per head more than heifers not aborted. It should be noted that this estimate is based solely on gain and dressing percentage. Additional costs for palpation, abortifacients, extra labor to calve term heifers, death loss, and differences in feed efficiency have not been included.

Discussion

The additional cost of feeding bred heifers in a feedlot represents a waste that is reflected in a lower dressing percent, higher treatment costs, and generally higher mortality due to dystocias and complicating metritis. The availability of prostaglandins as abortifacients has added an option to heifer feeding that has not been present since DES was removed from the market.

Four basic management options a feeder might consider for feeding heifers include:

1. Feed heifers like steers and handle the problems as they occur.
   This is the least desirable since dystocias tend to show up scattered throughout the heifer pens and generally take a great deal of time away from the regular pen checking and detection of other disease problems.
2. Closely manage heifers and sort off those which are obviously pregnant--before they start in labor.
3. Buy only open or spayed heifers. The availability of this type of heifer makes it impractical for many feeders.
4. Pregnancy examine heifers and use abortive agents.

The use of these agents should be delayed until at least 21 days after arrival at the feedlot to reduce the losses due to pneumonia and other disease complications. Thin or weak heifers are more likely to retain fetal membranes and are the ones most likely to suffer metritis and pneumonia.

The use of prostaglandins alone in heifers less than 120 days pregnant and in combination with dexamathasone in those exceeding 120 days pregnant can be utilized successfully to improve the efficiency of heifer feeding. Heifers should be pregnancy examined, and these products should not be used for 21 days after arrival at the feedlot. Using abortifacients in feedlot heifers should be considered a management tool to improve efficiency in the feedlot and must be used in conjunction with good management.

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