Induced Lactation of Infertile Dairy Cows

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Story in Brief

A trial was conducted to determine the lacteal response and subsequent fertility in non-lactating dairy cows that had failed to conceive. This was replicated in 1980 and 1981.

Seven of eight cows that were induced to lactation by hormone treatment produced in excess of 35 lb of milk per day. Two of three cows in the first replicate conceived, had normal gestations and calved normally. The second replicate is in progress, and conception data are not available yet.

Introduction

During any year, most dairymen have one or more of their genetically superior cows that fail to conceive by the end of lactation. Many times milk production of these cows decreases to a very low level, and it is not feasible to continue milking them. If lactation could be induced at a profitable level, efforts to get them bred could be continued. In addition, injection of the steroid hormones to induce lactation may alter the reproductive endocrine system of the cow and increase reproductive efficiency (Collier et al., 1975). The purpose of this study was to evaluate this treatment regime for the induction of lactation and to determine rebreeding performance of "problem breeders."

Material and Methods

Seven cows and one heifer in the University herd that were scheduled to be culled because of reproductive failure were used. These cows had all been dry at least 40 days. The animals ranged in age from a 30-mo-old heifer that had never calved to a 14-yr-old cow that had completed 10 lactations. All animals were given subcutaneous injections of estradiol (.1 mg/kg per day) and progesterone (.25 mg/kg per day) for 7 days. These materials were dissolved in ethanol with one half of the daily dose given at 12-hr intervals. Reserpine (5 mg/day) was given IM in the hip region. The injection schedule in 1980 was on days 1, 6, 11, 16 and 21. The injection schedule in 1981 was on days 8, 10, 12 and 14. Dexamethasone (20 mg/day) was injected IM on days 18, 19 and 20 in 1981. Dexamethasone was not used in 1980.

Milking of the cows was initiated when the teats became engorged or on day 21. The earliest milking was initiated on day 14.

Results and Discussion

The history and lactation performance of the seven cows and one heifer induced to lactate are presented in Table 1. Milk production varied from 4 lb to 57 lb per cow per day. Seven of the eight cows produced over 35 lb of milk per day.

Table 1. History and lactation performance of cows hormonally induced into lactation

Animal	Breed[a]	Previous lactations	Induced lactation		
			Peak milk yield, lb/day	305-day[b] yield	% fat
		1980			
1	H	10	57	12340	4.3
2	H	3	39	9600	4.2
3	H	0	35	8480	4.4
4	J	2	4	—	—
		1981			
5	H	2	52	—	4.5
6	H	1	49	—	4.2
7	H	7	45	—	3.9
8	H	2	44	—	3.5

[a]H = Holstein, J = Jersey.
[b]305 day production is not complete for 1981 animals.

This level of production is comparable to that reported by Collier et al. (1977). Fat test was higher in the induced lactation than in the previous normal lactation of the induced cows.

Two of the four cows treated in 1980 conceived, after two and four services. One cow did not milk and was not bred. The 14-yr-old cow became cystic and cycled irregularly after she was treated. She was bred four times but did not conceive. The two cows that conceived have calved and are milking normally this lactation. Conception information is not complete for the cows induced in 1981.

Previous research indicates that the hormones necessary for development of the mammary gland (similar to late pregnancy) and the initiation of lactation are estrogen, progesterone, glucocorticoids and prolactin. In this experiment the natural hormones estrodiol and progesterone were given, followed by injection of the reserpine and dexamethasone. Reserpine is a tranquilizer and hypotensive agent and also causes release of prolactin from the pituitary gland of the cow. The cows in this study showed various degrees of sedation after reserpine treatment. Reserpine injection was stopped after the third dose on one cow because of nasal congestion and labored breathing. After the fourth injection, one cow was sedated to the point she would not get on her feet for 24 hr. Both cows later returned to a normal healthy condition.

In this trial it was demonstrated that lactation can be induced in dairy cattle, and the hormonal treatment may enhance rebreeding. Although the level of production was below what one could expect following calving, it was high enough to offset the expense of keeping the cows in the herd for additional attempts at rebreeding.

Literature Cited

Collier, R. J., et al. 1975. J. Dairy Sci. 58:1524.
Collier, R. J., et al. 1977. J. Dairy Sci. 60:896.