

Evaluation of Oxytocin in Improving Beef Cattle Reproduction Rates

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As early as 1906, posterior pituitary extracts were known to be of benefit in increasing uterine musculature contractions (1). In the 1940's, the oxytocic activity of posterior pituitary extracts was isolated and used independently for its specific physiological effects. In 1960 it was determined that the uterine musculature had an increased sensitivity to oxytocin at parturition. The traditional use of oxytocin therefore has been to change the flaccid uterus with slow, non-productive uterine contractions to a uterus with strong, regular, productive uterine contractions to accomplish parturition. The natural level of oxytocic activity normally increases at or near parturition, and the possibility of a poorly developed or poorly sensitized neurohormonal reflex in the first calf heifer to stimulate this natural release of oxytocin from the posterior pituitary, is the basis for this clinical trial. The purpose for this clinical trial was therefore to determine the value of oxytocin administration at or near parturition in improving postparturient uterine involution in parturient first calf heifers, measured by their subsequent conception rates.

Materials and Methods

Purebred Angus first calf heifers, ranging in age from 23 to 33 months, were given 100 U.S.P. units of purified oxytocin principle* intramuscularly within four hours of parturition. A portion of these females were assisted during parturition and a portion were unassisted. A group of contemporary heifers, some receiving assistance and some being unassisted, were used as controls. The degree of calving difficulty was expressed in numerical scores of: (1) unobserved; (2) unassisted; (3) slight assistance; (4) difficult delivery; and (5) cesarean. All of the females calved during a 39-day period and had calves from the same sires. Observation for first estrus was initiated 30 days after all females

had calved. Observation for estrus and artificial insemination continued for 66 days, and heifers were examined for pregnancy 100 days after the breeding ceased.

TABLE I
Conception Rates of Heifers in Oxytocin Trial

	Assisted At Parturition		Unassisted At Parturition	
	Received Oxytocin	Control	Received Oxytocin	Control
Number of Head	51	64	53	52
Number not Pregnant	8	18	9	10
% Not Pregnant	15.7	28.1	17.0	19.2
Ave. Days to First Observed Estrus	109.7	108.1	105.8	110.0
Ave. Days to Conception	113.8	113.3	100.2	100.1
% No. Observed Estrus	2.0%	3.1%	3.8%	11.5%
Total Number Services	73	93	74	72
Services per Conception	1.70	2.02	1.68	1.71
Ave. Birth Weight, lbs.	69.7	67.1	63.5	64.6

Results

The results of the trial are expressed in Table No. 1. The significant results of the trial were:

- 12.4% difference in the conception rate of those heifers receiving assistance at parturition in favor of those which received oxytocin I.M.
- No significant difference in the average number of days to first observed estrus or average number of days to conception between those heifers assisted at parturition.
- Significant difference between services per conception of those heifers assisted at parturi-

*P.O.P. (Oxytocin Injection) Armour Baldwin Laboratories, Omaha, Nebraska.

tion favoring those which received oxytocin (+.32 services per conception).

- d. Slight advantage, not significant, in conception rate of those heifers which were unassisted at parturition, favoring those heifers which received oxytocin.
- e. Significant difference among the unassisted heifers in percentage of heifers having no observed estrus with those receiving oxytocin having a considerable advantage.

Discussion

This clinical trial reaffirms the accepted practice in veterinary obstetrics of using oxytocin as a portion of the after-care in dystocia cases in cattle. It also suggests that there is basis for use of oxytocin in most cases of parturition in the first calf heifer. The increasing frequency of high intensity beef cattle rearing units may require increased assistance from exogenous sources to maintain acceptable reproductive rates in beef cattle.

The effect of oxytocin in stimulating the contraction of the myoepithelial tissue of the udder to affect milk let down is an additional benefit from the use of oxytocin in first calf heifers for the prevention of agalactia. However, additional trials may indicate that the increase in milk let down and subsequent milk flow may be

detrimental to improving the number of days between parturition and subsequent estrus. The insignificant difference between trial and control heifers in average number of days to first observed estrus may be a result of this phenomenon.

The economic value of oxytocin in veterinary obstetrics for stimulating uterine involution can be measured by subsequent conception rates, but is dependent on the value of the cattle and their subsequent offspring. This factor should not be a consideration in routine use of oxytocin by the veterinarian in obstetrical cases, but should be a consideration in prescribing its use as a part of a total herd health program for a beef herd.

Summary

Oxytocin is particularly valuable in improving uterine involution and subsequent conception rates in first calf heifers requiring assistance at parturition. It also is valuable in increasing conception rates in those first calf heifers not requiring assistance at parturition. The use of oxytocin as a portion of the postparturient care should be considered as a prescribed portion of a beef cattle herd health program.

REFERENCES

- Jones, L. M. *Veterinary Pharmacology and Therapeutics*, 3rd Edition, Iowa State University Press, Ames, Iowa (1965): 784-785.

Control of Bovine Mastitis*

There is no immediate prospect of preventing new intramammary infections by immunization or by breeding resistant cows. *Str. agalactiae* can be eradicated from herds without laboratory assistance and a blitz therapy, and although more difficult, it is also possible to eradicate *Staph. aureus*. It is improbable that mastitis caused by *Str. dysgalactiae*, *Str. uberis*, Coliforms and Pseudomonads can be controlled by eradication, and control must therefore be achieved by preventive measures.

The prevention of intramammary infections should be regarded as one of the basic aims of good husbandry, rather than a separate additional task to be undertaken by the cowman.

Infections also occur in hand-milked cows, beef cows used for rearing calves and in un milked cows. Therefore, currently the most effective way of preventing infections is to employ a hygiene system during lactation to reduce the exposure of the teat to pathogens. The essential factor in the hygiene system is the routine use of an effective

post-milking disinfectant teat dip, though further benefit can be obtained by washing teats with a disinfectant using sterile cloths or paper towels, rinsing or pasteurising milking machine clusters before each cow is milked and wearing smooth rubber gloves.

During the dry period, the routine use of a disinfectant teat dip is less effective than a single intramammary infusion after the last milking of lactation with a specially formulated antibiotic preparation.

Antibiotic preparations that are currently available do not persist throughout the dry period and until greater persistence is achieved there may be some benefit from dipping the teats of dry cows daily, particularly one-two weeks before calving. Mastitis in heifers parturient can also be a problem and teat dipping for two-three weeks before parturition may be useful.

Disinfectant teat dipping is the most important hygiene technique to prevent new intramammary infections, but its effect can be nullified by failure to observe other simple management practices.

*Abstracts from a paper on "The Prevention of Intramammary Infection" by F. K. Neave and E. R. Jackson at a symposium on Mastitis, Reading University, England, January 1971.