

1985

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Recommended Citation

Jordan, K.J.; Morrill, J.L.; Reddy, P.G.; and Higgins, James J. (1985) "Effect of buffer in prestarter on calf performance," *Kansas Agricultural Experiment Station Research Reports: Vol. 0: Iss. 2.* <https://doi.org/10.4148/2378-5977.3076>

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Effect of buffer in prestarter on calf performance

Abstract

Previous work at the Kansas Agricultural Experiment Station contributed to the development of an early weaning program (see 1984 Dairy Day, Report of Progress 460). This program involves the use of a prestarter, which is a specially prepared feed intended to encourage early dry feed consumption and rumen development. Because all of the carbohydrate in the prestarter is lactose and because the rumen of the very young calf is not adapted to utilization of starch, rapid fermentation might cause excessive acidity in the developing rumen, a condition that might be avoided by adding a buffer to the prestarter. This experiment was conducted to test that hypothesis.; Dairy Day, 1985, Kansas State University, Manhattan, KS, 1985;

Keywords

Kansas Agricultural Experiment Station contribution; no. 86-94-S; Report of progress (Kansas Agricultural Experiment Station); 484; Dairy; Buffer; Calf performance; Feed consumption; Prestarter; Weight gain

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EFFECT OF BUFFER IN PRESTARTER
ON CALF PERFORMANCE

K. J. Jordan, J. L. Morrill,
P. G. Reddy, and J. J. Higgins

Summary

Including 3.0% sodium bicarbonate in the prestarter fed to young calves did not improve performance significantly.

Introduction

Previous work at the Kansas Agricultural Experiment Station contributed to the development of an early weaning program (see 1984 Dairy Day, Report of Progress 460). This program involves the use of a prestarter, which is a specially prepared feed intended to encourage early dry feed consumption and rumen development. Because all of the carbohydrate in the prestarter is lactose and because the rumen of the very young calf is not adapted to utilization of starch, rapid fermentation might cause excessive acidity in the developing rumen, a condition that might be avoided by adding a buffer to the prestarter. This experiment was conducted to test that hypothesis.

Procedures

Twenty-seven Holstein bull calves were assigned to one of two experimental groups at 1 day of age and remained on the experiment for 6 weeks. The calves were fed colostrum for 3 days after birth, then milk until weaning. Each was fed at 8% of birth weight daily in two equal feedings. Prestarter was fed until consumption was $\frac{1}{2}$ lb. per animal per day, then a mixture of $\frac{1}{2}$ lb. prestarter and as much starter as the calf would eat was fed. The calves were weaned when consuming 1 pound of dry feed daily if at least 2 weeks of age, or at 3 weeks of age if not yet weaned.

Calves in one group were fed normal prestarter (Table 1), and calves in the other group were fed the same prestarter with 3% sodium bicarbonate added. The composition of the starter fed is shown in Table 2. All calves were stimulated to eat dry feed by putting a small amount of prestarter in their milk.

Feed consumption, weight gains, fecal consistency, and observations of health were recorded. Blood samples were analyzed for glucose and urea nitrogen as indicators of rumen development.

Table 1. Composition of Prestarter¹

Ingredient	%
Whey, dried	46
7-60 ²	23
Skim milk, dried	19
Sodium caseinate	12
Additives	+

¹Calfweena, Merricks, Union Center, Wisconsin

²A mixture of milk solids and fat containing 7% protein and 60% animal fat.

Table 2. Composition of calf starter¹

Ingredient	%
Alfalfa, ground	25
Corn, cracked	30
Oats, rolled	20
Sorghum Grain, rolled	8.5
Soybean Meal	10.0
Molasses, dry	5.0
Dicalcium Phosphate	.7
Limestone, ground	.3
Salt	.25
Trace Mineral Salt	.25
Vitamins A&D	+ ²

¹Pellet, 3/8 inch Diameter

²1000 I.U. Vitamin A and 136 I.U. vitamin D per lb.

Results and Discussion

Starter consumption and body weight gains are shown as weekly averages in Tables 3 and 4, respectively. Differences between groups in weight gains, feed consumed, incidence of scours, or general health of the calves were not significant. Overall averages for serum glucose were 73.1 and 76.2 mg/dl and for serum urea nitrogen were 11.3 and 11.2 mg/dl for calves given control and buffered prestarter, respectively. Neither of those measurements were significantly different between groups.

Under the conditions of this experiment the added buffer was not beneficial. Only one type of buffer was used and that was added at only one level. Possibly sodium bicarbonate at a greater or lesser concentration, or a different type of buffer would be beneficial.

Recommendation

Based on the results of this study, do not add buffer to prestarter.

Table 3. Weekly starter consumption, pounds¹.

Type Prestarter	Weeks						Weekly average
	1	2	3	4	5	6	
Control	.09	.35	1.96	10.6	18.3	26.4	9.68
Buffered	.11	.46	2.44	12.1	21.1	27.5	10.56

¹Differences from addition of buffer were not significant ($P > .05$)

Table 4. Weekly weight gains, pounds¹

Type Prestarter	Weeks						Weekly average
	1	2	3	4	5	6	
Control	4.62	4.84	5.28	7.7	12.1	16.1	8.45
Buffered	4.84	1.1	7.04	8.1	15.6	13.0	8.29

¹Differences from addition of buffer were not significant ($P > .05$)

