

First postweaning calf grouping critical

OVER the last 10 years, the number of pages published in the *Journal of Dairy Science* has doubled, and while the number of U.S.-authored papers has remained static, papers authored by people outside the U.S. have greatly increased to currently comprise more than 60% of papers.

This has provided new ideas, perspectives and research results, especially in the calf area.

A recent example of that is a study by Faereverk et al. (2010).

As background, the authors noted that housing preweaned calves in groups gave the calves the opportunity to perform normal social behavior compared to calves that were individually housed. However, they also noted that group-housed calves may not fare as well due to competition, especially for those calves ranking low in the social order when access to feed and other resources may be limited.

Weaning is a major challenge to calves, especially since it is too often accompanied by other changes such as regrouping, vaccinations and other treatments, de-horning if not already done, changing starters to growers and introducing forage. These changes can create stress, lower immunity and result in respiratory problems that can impair calves for life (Kertz, 2001).

The Faereverk et al. study used 72 male and female Norwegian Red calves born from October through May in six groups. Three groups consisted of 12 calves of a similar age (homogeneous groups), while the other three groups consisted of six young and six old calves (heterogeneous groups). Table 1 shows the composition of these groups. Note that the analysis used only those calves in the homogeneous group that were the same age as calves in the heterogeneous group.

Calves were not separated from their

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dam until 48 hours after birth but then were put into straw-bedded individual pens, where they had limited contact with neighboring calves through bars.

Calves were given six liters of colostrum daily for their first five days. They were then given six liters of milk replacer from teat buckets in two equal-quantity daily feedings.

Calves were initially offered 2.2 lb. daily of a "standard Norwegian calf starter" but then later were offered 3.3 lb. per day when the lesser amount fed was consumed. A "high-quality hay" and water were offered free choice from birth.

When the youngest calf in the homogeneous and heterogeneous groups was five weeks old, all calves in the group were abruptly weaned.

When introduced into experimental pens, calves were fed 3.3 lb. of calf starter daily and free choice "high-quality hay" and water.

Calves were weighed at the beginning and end of the 14-day experimental period.

The experimental pen provided 32 ft. x 31 ft. of total space with four straw-bedded lying areas (12.1 ft. x 12.8 ft.), providing 12.9 sq. ft. per calf. All calves could eat simultaneously with 2.6 ft. per calf at post-and-rail feed mangers.

The building was insulated with an automatically ventilated and heated area that had a temperature set at 50°F.

Individually marked calves were video recorded after grouping for 24 hours on days 1, 7 and 14.

Time spent feeding increased numerically or statistically significantly at $P < 0.5$ over the 14-day study period, while time spent lying increased ($P < 0.05$) only from day 1 to day 7 (Table 2). Time spent lying alone did not change by treatment or day.

1. Calf grouping averages and variation

	Calf groups		
	Homogeneous	Heterogeneous-young	Heterogeneous-old
Initial bodyweight, lb.	140.7 ± 26.2	124.0 ± 15.7	194.2 ± 16.4
Age, days	41.1 ± 6.5	35.1 ± 4.4	82.7 ± 7.7
Age range, days	30-54	30-42	70-94

2. Percentage of time (in days) spent feeding and lying across groups and for number of displacements from feed bunk

% of day	Day 1	Day 7	Day 14
	Feeding	13.1 ^a ± 1.3	19.7 ^b ± 1.2
Lying	55.8 ^a ± 1.5	65.4 ^b ± 1.3	62.9 ^b ± 1.3
Active	6.0 ^a ± 0.5	2.1 ^b ± 0.4	1.5 ^b ± 0.4
Displacements from feed bunk, number	0.38 ^a	1.73 ^b	3.05 ^c

a,b,cP < 0.05.

3. Percentage of time spent exploring between groups by days in group

Day	Homogeneous	Heterogeneous
1	9.9 ^a ± 1.1	3.5 ^b ± 0.9
7	3.8 ^b ± 0.9	5.3 ^b ± 0.9
14	5.0 ^b ± 0.9	4.9 ^b ± 0.9
Social approach exploring, %	35.2 ^a ± 3.6	21.7 ^b ± 3.0
Daily gain, lb.	1.64 ^a	1.27 ^b

a,bP ≤ 0.05.

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Calves in homogenous groups spent more time exploring on day 1 ($P < 0.05$) than on days 7 and 14 and on day 1 versus heterogeneous groups (Table 3).

Social approach (explained in detail in the published paper) exploring a test area was greater in homogeneous groups than from calves in the heterogeneous groups.

Average daily gain was 29% greater in homogeneous groups versus heterogeneous groups.

Key points gleaned from the study include:

- In both groups of calves on the first day of grouping, calves spent more time exploring their new environment and less time eating and lying.

- In the social approach test, calves in homogeneous groups spent more time exploring than heterogeneous groups, possibly because they had less fear and were more exploratory in a novel social situation.

- As a newly weaned calf, young calves entering homogeneous groups gained more over the 14-day period than heterogeneous groups, possibly because the latter calves ate less (not measured) and had more fear than their older, larger group mates.

- Within heterogeneous groups, older calves displaced younger calves from the feed manger.

- In heterogeneous groups, calves preferred another calf of the same age as a resting partner, with the average number of calves resting close together being 3.2 animals.

How would this apply to larger outdoor operations?

In an abstract presentation (Matuk et al., 2010) at last summer's Joint Annual Meeting in Denver, Colo., individual calf feed intakes during the last three weeks of 56 days in hutches were measured for preweaned replacement Holstein calves in southern Idaho. The calves were classified into highest and lowest quartiles.

Then, 480 calves in groups of 20 were grouped into the following: 20 randomly chosen calves (control), 20 with the highest quartile (HH), 20 with the lowest quartile (LL), five calves from the lowest and 15 from the highest quartiles (LHH), 15 calves from the lowest and five from highest quartiles (LLH) and 10 calves each from the highest and lowest quartiles (HL).

Calves were then fed a total mixed ration of 95% starter with 5% alfalfa hay, and intake was measured for four weeks in the pens.

Average intakes and daily gains were greatest in descending order: HH, HHL, HL, control, LLH and LL, with the exception of a switch between control and LLH in daily gain versus intake.

Similarly, the variation in final bodyweight was lowest for the HH group and then increased in the following order: LL, control, LLH, HHL and HL.

The first grouping of calves postweaning is most critical. The Matuk study found that minimizing variation in that first grouping improved overall heifer performance and diminished variation. Thus, grouping according to intake/performance may reduce variation in performance.

The Bottom Line

Just-weaned young calves fared better and had greater daily gain when they were put into homogenous groups by age and bodyweight than when they were placed in heterogeneous groups.

In a large-scale trial, minimizing variation in that first grouping after calves were raised in individual hutches improved overall heifer performance and diminished variation.

These studies indicate that the first grouping after calves are weaned is critical, and grouping according to factors such as age, bodyweight and prior intake/performance may reduce variation in performance and may even improve performance.

References

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