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Summary

Sorting steers for three different finishing systems (calf-feds, summer yearlings and fall yearlings) resulted in no differences in performance or average carcass characteristics compared to unsorted steers. Sorting decreased variation in hot carcass weight and number of carcasses over 950 lb. Sorting did not increase profit when calf-feds or fall yearlings were sold live compared to unsorted calf-feds and fall yearlings. However, when sold on a grid basis, sorting did increase profit for summer and fall yearlings.

Introduction

Cattle are commonly sorted by weight into different production systems at the time of weaning. The three production systems are calf-feds, summer yearlings and fall yearlings. There are many different variations of these three production systems. In Nebraska, it is common for calves to be born in March and weaned in the fall in October or November. When a calf is weaned, weight is used to determine which production system is best for that particular animal. This is done because calf-feds tend to be excessively fat and yearlings become overweight by the time of slaughter (2007 Nebraska Beef Report, pp. 58-60).

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Procedure

Experiments

The three production systems compared were calf-feds, summer yearlings and fall yearlings. All cattle entered the UNL facility at the time of weaning in the fall. Calf-feds entered the feedlot at weaning, were finished during the winter months and marketed in May. Summer yearlings grazed cornstalks throughout the winter and were supplemented with wet corn gluten feed at 5 lb/steer daily. Summer yearlings did graze grass for less than 30 days just prior to entering the feedlot in May. The summer yearlings were finished during the summer months and marketed in October. Fall yearlings grazed cornstalks during the winter months, similar to the summer yearlings, and also received 5 lb/steer of wet corn gluten feed daily. When the fall yearlings were removed from cornstalks, they grazed native range throughout the summer months (at University of Nebraska Barta Brothers Ranch) and were fed in the feedlot from September to January.

The year 1 group was comprised of Nebraska ranch direct calves (n = 288), while cattle in year 2 were from a Nebraska sale barn (n = 288). In each year, all cattle were purchased in October. After being limit fed for five consecutive days, weights were collected on two consecutive days. The cattle were then assigned randomly into one of three groups: calf-feds, summer yearlings and fall yearlings, but were never sorted based on BW. The sorted group was sorted based on BW after the five-day limit-feeding period. The heaviest third of the sorted group was placed into the calf-fed production system to minimize overweight carcasses at slaughter. The remaining two-thirds of the sorted group were placed on cornstalks to graze over the winter. In the spring, the sorted group was then sorted based on BW after grazing cornstalks. Of the remaining two-thirds of the sorted group, the heaviest half were fed as summer yearlings during the summer, and the lightest half grazed native range and were fed as fall yearlings to decrease the number of overweight carcasses (Figure 1).

When cattle from each production system (calf-fed, summer yearling and fall yearling) were in the feedlot, there were eight steers/pen and six replications (pens) as sorted and unsorted. This configuration was repeated both years. The experimental design was a 2 x 3 factorial with pen being the experimental unit. The factors were sorted, unsorted and three different feeding time periods (calf-fed, summer yearlings and fall yearlings).

Economics

The profitability of these three production systems was examined under three scenarios: live vs. grid pricing, time of year the cattle were finished and sorted vs. unsorted. The sorted calf-feds were calculated to a maximum break-even purchase price by subtracting all costs from the final live price and dividing by the weight of the animal at receiving. Total costs included feed cost, yardage, death loss and animal interest, as shown in Table 1, to make comparisons relative to unsorted groups. (Continued on next page)
to the sorted calf-feds. The average 2007 dressed price was multiplied by 0.63 to determine the final live price for the cattle (Table 2). The initial feeder cattle price was figured for the sorted calf-feds first. Using the average weight and price of the sorted calf-feds, a feeder cattle price slide was calculated (Dhuyvetter, Extension agricultural economist, Kansas State University), assuming a corn price of $4/bu. The slide included the feeder cattle weight, corn price and predicted fed-cattle price. The price slide was then used to yield feeder cattle prices for different weights of feeder cattle.

The total costs for the finishing period for all three production systems were calculated similarly. Corn was priced at $4/bu, and wet distillers grains were priced at 80% the price of corn (DM basis). The summer yearlings and fall yearlings had additional costs for grazing corn stalks and grass. The costs for the wintering period and summer grazing, which are shown in Table 1, were added to the initial animal price to give the price of the
animal entering the feedlot.

To calculate the grid price received, the average 2007 dressed price was used. A seven-year index was used to get the price for the month in which the cattle were marketed and adjusted based on the index. The index-adjusted price was then added to one, minus the percent Choice, multiplied by the Choice-select spread shown in Table 2, in order to calculate the price for yield grade 3 Choice carcasses. The grid base price for the three months in which the cattle were sold (January, May and October) was then averaged to get the final base grid price. Discounts were given for select grade carcasses along with yield grade 4 and 5 carcasses and any carcasses over 950 lb and 1000 lb. Premiums were awarded for upper 2/3 Choice or better and prime quality grades and yield grades 1 and 2 (Table 2).

**Results**

**Weight**

There were interactions ($P < 0.01$) between sorting and system for initial BW and HCW (Table 3) by design. The calf-feds in the sorted group had greater initial BW compared to the unsorted calf-feds. There was no difference in initial BW between sorted and unsorted summer yearlings. The unsorted fall yearlings had higher initial BW compared to the sorted fall yearlings. The HCW follows the same pattern as the initial BW. The standard deviations for initial BW and HCW were lower for the sorted groups compared to the unsorted groups for all three systems (Table 3).

There also was a significant interaction for dry matter intake (DMI) ($P < 0.01$) and feed-to-gain ratio (F:G) ($P = 0.03$). The unsorted fall yearlings had the highest DMI. The sorted fall yearlings had the next highest DMI, which was higher than DMI for both the sorted and unsorted summer yearlings and calf-feds. There was no difference in DMI between the sorted and unsorted summer yearlings. However, the sorted and unsorted summer yearlings did have a higher DMI than their calf-fed counterparts. DMI was generally related to BW.

The unsorted calf-feds had the lowest F:G followed by the sorted calf-feds (Table 3). There was no difference in F:G between the sorted and unsorted summer yearlings, which had a lower F:G than the fall yearlings. Within the fall yearlings system, there was no F:G difference between the sorted and unsorted groups. Many have the perception that heavier calf-feds are the “poor doers.” However, in this study the lightest cattle that entered the feedlot had the lowest F:G (Table 3). There was no interaction for average daily gain (ADG) ($P = 0.80$). Gains were affected by system, with calf-feds having the lowest ADG; however, there was not a difference in ADG between summer and fall yearlings.

There was not a significant sorting by feeding period interaction for fat thickness ($P = 0.32$) and USDA called marbling scores ($P = 0.09$) (Table 3). However, there was a difference due

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to the production system ($P < 0.01$) in which the cattle were finished. Fat thickness was not different for calf-
feds and summer yearlings. Fall year-
lings had less fat thickness compared to the calf-feds and summer yearlings. The summer yearlings had the lowest
marbling score, and there was no differ-
ence in marbling between the calf-
feds and fall yearlings. There was an
interaction for the percent of carcasses that had a HCW of 950 lb or higher and 1000 lb or higher ($P < 0.01$). The unsort-
ed fall yearlings had the highest percentage of carcasses over 950 lb, with 35.4%. Of the unsorted summer
yearlings, 10.42% had overweight car-
casses, followed by 6.4% of the sorted
fall yearlings. In each of the remain-
ing three groups, approximately 2%
had HCW over 950 lb. The unsorted
fall yearlings had the highest percent-
age of carcasses over 1000 lb (17.71%),
which was greater than all other
groups.

Pasture gain for summer and fall
yearlings in year 2 was poor compared to gain in year 1. The cattle for year
1 had an average BW of 711 lb going onto grass and entered the feedlot
weighing 976 lb. Year 2 cattle averaged 724 lb going onto grass and entered the feedlot at 825 lb.

The overall summary from the
performance analysis was that the
sorted calf-feds had a higher initial
feedlot BW compared to the unsorted
calf-feds. The unsorted fall yearlings had a higher initial feedlot BW com-
pared to the sorted fall yearlings. The unsorted calf-feds, the lightest cattle
to enter the feedlot, were the most
efficient. The amount of initial BW
and HCW variation was decreased for the sorted groups compared to the
unsorted groups. Decreasing the variation of HCW did not affect fat
thickness or quality grade. This led to fewer overweight carcasses for the
sorted fall yearlings when compared to the unsorted fall yearlings.

Economics

Weights used for the feeder calf
prices were 450 lb, 550 lb, 650 lb and
750 lb, with prices of $122.39/cwt, $112.06/cwt, $107.26/cwt and $103.25/
cwt, respectively, based on the feeder
cattle price slide. The prices of the di-
et were $0.0887/lb for year 1 and $0.0819/
lb for year 2, because of different diets
between years. The summer yearlings
had the highest live profit ($31.08/steer)
on average. The calf-feds were next
with an average value of $24.50/steer.
The fall yearlings were least profitable
of the three groups on average, with a
live value of $20.09/steer. The calf-feds
had a grid profit of $49.89/steer. The
fall yearlings’ profit was $12.67/steer,
and the summer yearlings’ profit was
$8.28/steer on average.

The fall yearlings were the least
profitable on a live basis, due to this
group having the highest production
costs of all three groups. The fall year-
lings were heaviest, but that did not
make them more profitable, due to the
extra weight that had to be gained in
the feedlot in the second year of the
study instead of gaining the weight on
grass. In the first year, fall yearlings

gained 1.78lb/day on grass compared to
0.66lb/day for year two with 149 days
and 152 days on grass, respectively.

On the grid basis, the calf-feds had
the highest profit, followed by the
fall yearlings. The calf-feds and fall
yearlings graded well compared to the
summer yearlings. The summer yearlings were least profitable because the
percent choice was lowest at 59.4%
choice.

The marketing method (i.e., live
or grid) used had a large impact on
profit or loss. The sorted calf-feds had
the largest change in profits of $28.31/
steer going from a live to grid basis,
with unsorted calf-feds increasing
$22.48/steer. The summer yearlings
were not profitable going from the live
to grid values. The sorted summer
yearlings had a smaller decrease in
profit ($-14.55/steer) than the unsort-
ed summer yearlings ($-31.06/steer).
The summer yearlings decreased in
profit primarily because the cattle did
not grade USDA Choice. The sorted
fall yearlings increased profit by
$10.07/steer on the grid compared to
live value. However, the unsorted fall
yearlings, when going from the live to
grid values, lost $24.91/steer, due to
the amount of overweight carcasses in
the unsorted group. The sorted cattle
always had a higher profit when going
from a live value to a grid value.

Over all feeding periods, the un-
sorted cattle had a higher profit on
a live basis compared to the sorted
cattle, at $30.80/steer and $19.64/steer,
respectively, because the unsorted
calf-feds were more efficient and ate
less than the sorted calf-feds. This
greater efficiency decreased the pro-
duction cost for the unsorted group.
On the grid basis, the sorted cattle
were better at $27.58/steer compared to the unsorted cattle at $19.64/steer,
due to the discounts for overweight
carcasses in the unsorted group.

This analysis would indicate sort-
ing cattle for a production system did
not increase profit when cattle were
marketed live. However, assuming all
cattle were sold on a grid, then sorting
increased profits. There also are argu-
ments suggesting that cattle be sold on
a grid in order to avoid the discounts
associated with marketing cattle on a
live basis. Discounts may be applied
to cattle sold on a live basis because the
cattle buyer cannot be certain of the
quality of the cattle purchased. The
assumption in this paper, however, is
that all cattle sold live are given the
average price.

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