National and regional effects of value-added vaccination programs on prices of calves sold through the Superior Livestock Auction

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Introduction

Several programs have been established for cow-calf producers to market benefits of high health and management standards. Our objective was to estimate effects of value-added vaccination (VAC) programs on calf prices sold through Superior Livestock Auctions (SLA), the largest video cattle marketing network in North America. Superior Livestock Auctions VAC programs specify types and timing of vaccinations, qualifying vaccines, if calves were home raised, and/or minimum number of days weaned prior to delivery. Estimates of value added by VAC programs may help improve management and marketing decisions.

Materials and methods

Data on 28,991 calf lot transactions from 2019 and 2020 calendar years were used. For this study, models were estimated yearly for the national market, and for individual regions in 2020. Six U.S. regions were defined: 1 (CA, ID, NV, OR, and WA), 2 (CO, MT, ND, NE, SD, UT, and WY), 3 (AR, AZ, LA, NM, OK, and TX), 4 (IA, IL, KS, MN, MO, and WI), 5 (AL, FL, GA, and MS), and 6 (all states Northeast of and including IN, KY, MI, NC, SC, and TN). Due to low transaction volume and multi-collinearity concerns, regions 5 and 6 were combined for analysis. Five VAC program categories were analyzed. Broadly, these categories range from vaccination at 2-4 months of age (VAC24), and/or on the cow prior to shipping (VAC34(+)), or multiple vaccinations before, during, and/or after weaning for 45 days (VAC45(+)) or 60 days for home raised (VAC60) or purchased calves (VACPreCon); details can be found here: **http://www.superiorlivestock.com/files/vac_programs. pdf.** Economic models were first developed by including all variables that were associated with calf prices. Final model specifications were established to estimate marginal effects of factors on calf sale prices, after removing non-significant factors and addressing multi-collinearity issues.

Results

For 2019 and 2020 calf lots, both national models indicated that calves qualifying for VAC programs sold for a premium (overall P-values < 0.01), even after accounting for other significant price predictors such as weight, sex, region, flesh, frame and other calf or sale characteristics. In 2019, national average premiums for calf lots were 2.75, 5.97, 6.16, and 7.20 $/100 lbs [45.5 kg (cwt)] for VAC34(+), VAC45(+), VAC60, and VACPreCon, respectively, compared to VAC24. National average 2020 premiums were 2.58, 7.51, 7.92 and 8.60 $/cwt for those same programs. When modeling 2020 prices within regions, average premiums in regions 1

and 2 were 11.14 and 12.45 $/cwt, respectively, for lots receiving VACPreCon protocol, compared to VAC24 (P < 0.05). In region 3, lots that received VAC45(+), VAC60, or VACPreCon protocols all had similar average premiums of 7.26, 7.55, and 7.01 $/cwt, respectively; however, in regions 5 and 6, the premiums were only 5.16, 4.38, and 3.91 $/cwt, respectively, for lots in these same programs (all significantly greater than VAC24; P < 0.05). Unique to region 4, VAC24 and VACPreCon programs resulted in the greatest (P < 0.05) value added among VAC programs. Importantly, all premiums given are of marginal effects; i.e., overall price paid for lots also would be affected by other significant factors such as sex, weight, horns/polled, breed, frame, flesh and others; these may vary in frequency among regions (data not shown).

Significance

The SLA VAC programs demonstrated higher sale prices of calf lots in both 2019 and 2020, even after accounting for other calf and sale characteristics that significantly impacted price. Nationally, VAC45(+), VAC60 and VACPreCon programs added the largest premiums for calf lots; however, other VAC premiums varied significantly by region. An online calculator, developed to incorporate expected premiums (based on 2020 SLA data) and allow input of anticipated production costs, may enable more informed management and marketing decisions **(https://agmanager.info/livestock-meat/cross-subject-areas/ ksu-merck-calf-vaccination-program-assessment-tool).**

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