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Livestock Production and Health

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Market Report	Year Ago	4 Wks Ago	10-2-17
Livestock and Products, Weekly Average			
Nebraska Slaughter Steers, 35-65% Choice, Live Weight.	100.21	*	108.50
Nebraska Feeder Steers, Med. & Large Frame, 550-600 lb.	143.09	168.72	184.62
Nebraska Feeder Steers, Med. & Large Frame 750-800 lb.	141.27	150.91	165.54
Choice Boxed Beef, 600-750 lb. Carcass.	188.63	191.65	195.81
Western Corn Belt Base Hog Price Carcass, Negotiated	48.53	62.21	49.70
Pork Carcass Cutout, 185 lb. Carcass 51-52% Lean.	75.24	84.19	72.23
Slaughter Lambs, wooled and shorn, 135-165 lb. National.	158.36	166.77	167.17
National Carcass Lamb Cutout FOB.	353.14	414.52	409.72
Crops, Daily Spot Prices			
Wheat, No. 1, H.W. Imperial, bu.	2.64	3.09	3.17
Corn, No. 2, Yellow **Columbus**, bu.	*	3.15	3.07
Soybeans, No. 1, Yellow **Columbus,** bu.	*	8.67	8.67
Grain Sorghum, No.2, Yellow Dorchester, cwt.	4.66	5.27	5.38
Oats, No. 2, Heavy Minneapolis, Mn, bu.	5.51	2.77	2.97
Feed			
Alfalfa, Large Square Bales, Good to Premium, RFV 160-185 Northeast Nebraska, ton.	160.00	*	*
Alfalfa, Large Rounds, Good Platte Valley, ton.	68.75	92.50	85.00
Grass Hay, Large Rounds, Good Nebraska, ton.	70.00	97.50	85.00
Dried Distillers Grains, 10% Moisture Nebraska Average.	112.50	105.00	115.50
Wet Distillers Grains, 65-70% Moisture Nebraska Average.	40.50	39.00	42.00

*** No Market**

As in Nebraska and other cattle-producing states, livestock are an important source of income for hundreds of millions of people living in developing countries. However, for livestock keepers in developing countries, animals are often central to multiple dimensions of the family's existence, providing—in addition to income—important sources of energy-dense, nutrient-rich animal source foods, generating cultural status, including playing a role in family formation through wedding dowries, and serving, for some, as the household's primary store of wealth. Livestock play all of these roles in pastoralist—semi-nomadic livestock-keeping—communities. While in the past pastoralism was a relatively common way of life throughout the world, today pastoralists are few and typically inhabit marginal, rural lands, which makes it harder for them to access important services, such as education, and human and livestock health resources. Researchers also estimate that pastoralists are frequently among the poorest members of the societies they inhabit.

Many countries in East Africa—Ethiopia, Kenya, and Tanzania, among others—still contain sizeable pastoralist communities. East Africa contributes importantly to total cattle production in Africa—the total number of cattle owned in Tanzania constitutes the third largest national herd on the continent. Most livestock in East Africa are raised in smallholder systems, which includes pastoralists' holdings. Recent changes in climate and rapid growth of human populations, which leads to conversion of land to agriculture or other uses, have reduced the amount of suitable land available for pastoralists to graze their herds, resulting in higher concentrations of animals grazing the same land

and depending on the same water sources. The threat to pastoralists from severe, periodic droughts has received much attention from governments, aid agencies, and academics. Livestock disease, which poses an important, but less systemic, threat to pastoralists and their herds, has received less attention, despite being, for many pastoralists, more harmful than climate-related risks.

Livestock diseases endanger livestock health and human wellbeing. Diseases may lead to animal deaths or decreases in animal productivity—whether by hindering the growth of the animal or reducing the availability of livestock products, such as milk. Pastoralists reliant on livestock feel the effects of disease through losses in the productivity and value of their animals and decreased availability of nutrition from animal source foods. In some cases, livestock diseases also directly put human health at risk—it is estimated that over 60 percent of livestock diseases are zoonotic, or capable of being transmitted from animals to humans. Widespread disease outbreaks can have regional or national level effects too, resulting in lower market prices for animals, quarantines, loss of public trust in the livestock sector, or trading restrictions imposed by other countries. All of these effects interact to reduce human wellbeing and development in livestock-dependent communities. Children, in particular, can experience life-long negative effects on growth and cognitive development resulting from a reduction in the availability of animal source foods and repeated exposure to disease.

Although pastoralists have sophisticated knowledge of livestock health for the animals and diseases with which they are familiar, changes in climate and intensification of livestock grazing patterns have introduced new diseases and altered the dynamics of known diseases. In Tanzania, pastoralists face multiple emerging diseases, which traditional disease prevention strategies and treatment remedies have not evolved to control, that threaten livestock health and human wellbeing. When facing novel, unknown diseases, access to livestock health services is a critical need for producers. Veterinary health services can help prevent or treat livestock diseases, reducing the burden of disease on animals and humans. However, for many rural livestock-producing households in East Africa (and elsewhere in the developing world), veterinary health infrastructure is underdeveloped, leaving individuals with little access to private or public veterinary health services.

In Tanzania, for instance, the government began to shift the veterinary health sector from a public to a private model of service provision within the last two decades, though private veterinarians or para-veterinarians have not moved into many rural areas to fill the vacuum left by the public system (Rutabanzibwa 2002). With large spatial gaps in veterinary health service coverage, much of the knowledge about the effect livestock health products designed to .prevent or treat diseases—such as vaccines or antimicrobials—have on livestock health and human health, wealth, and nutritional status come from government or donor-led vaccination intervention programs. Even more importantly, livestock producers' treatment decisions made during an intervention may not reflect the choices they would make under normal conditions. There is little evidence from the field to suggest how rural livestock producers make use of vaccines or antimicrobials in response to disease outbreaks

Despite the lack of evidence on the uptake of livestock health products by rural livestock producers under natural conditions, there is some evidence from previous studies on producers' preferences for services and product attributes. Rural livestock keepers desire access to veterinary health services. Among households participating in a study in isolated communities in south-central Tanzania, pastoralists believed a lack of access to veterinary expertise and veterinary health supplies was a major impediment to their wellbeing (Gustafson et al., 2015). Survey respondents listed increased availability of veterinary drugs and vaccines, as well as education on emerging livestock health issues that would be delivered to members of the household among their highest priorities for pathways to improved livelihoods. During the study period, there were no veterinarians or veterinary dispensaries located in the 21 villages involved in the study. Residents of these villages only had access to six livestock extension officers spread among the 21 villages participating in the study. As a further challenge, none of these villages had diagnostic capacity—either in the form of equipment, such as microscopes, or laboratory space. Even electricity, which would enable the quick establishment of veterinary health facilities, was not available in the study area. The lack of electricity presents a further challenge to providing vaccines or antibiotics that need to be stored at a certain temperature. While there are some vaccines and drugs that could be stored with the resources currently available, only veterinarians and livestock extension officers can legally prescribe and administer these products (Rutabanzibwa, 2002).

A study conducted with pastoralists in Kenya examined their willingness to pay for each individual respondent's ideal vaccine program for contagious bovine pleuropneumonia (CBPP), which is a deleterious respiratory disease affecting cattle and for the current default type and method of CBPP vaccine delivery (Kairu-Wanyoike et al., 2014). For the ideal vaccine program, respondents were able to indicate preferences for the vaccine itself—such as the frequency of administration—and the delivery method (e.g., private or government veterinarian). The number of respondents

who were willing to pay positive amounts for CBPP vaccines doubled when facing their preferred vaccine program rather than the default program, rising to approximately two-thirds of the study population. Additionally, the average amount of money that respondents were willing to pay tripled when the vaccine program represented the respondent's ideal. However, even when facing their ideal CBPP vaccine product, 40 percent of respondents were not willing to pay even the standard fee for this service despite the fact that the authors calculate that the benefits from vaccination significantly surpass the costs.

Vaccination interventions—in which, for instance, non-governmental aid organizations external to the community introduce access to vaccines, frequently at subsidized prices—often show large positive effects from access to livestock health products. When households are given ready access to vaccines at free or reduced prices, many households opt to vaccinate their livestock, protecting themselves from disease outbreaks and effectively insuring their animals against a major source of risk. Follow-up studies, however, frequently find that these effects are transitory. While it is not clear why vaccination rates drop off after the end of an intervention, it may be due, at least in part, to hidden, real-world barriers to vaccination. Some potential obstacles have been discussed in a previous Cornhusker Economics article on barriers to the use of Newcastle disease vaccines in rural, developing country settings (Using Behavioral Economic Insights to Improve Program Design, November 11, 2015, p. 2): "Newcastle vaccines are administered in a series of doses every few months, and the purchased product constitutes multiple doses that must be diluted. Only 13 percent of the women in [the study were] able to sign their names; it is likely that functional literacy and numeracy are even lower, rendering a vaccination process that requires following written instructions and keeping track of time-sensitive application of doses over fairly long periods of time very difficult." The vaccine for Newcastle Disease—which is a major cause of disease-related deaths among chickens—has to be administered at multiple time points over a relatively long period of time. These characteristics of the Newcastle vaccine, which would be a minor hurdle to most, may be an insuperable barrier to rural women—the household members frequently responsible for chicken production—in developing countries, many of whom have not had the opportunity to receive any formal education and therefore are effectively illiterate.

Other considerations may influence vaccination decisions in these households. Research from Kenya shows that household characteristics affect willingness to pay for livestock vaccines beyond the attributes of the vaccine delivery program (Kairu-Wanyoike et al., 2014). For instance, households that had more recent experience with the disease were willing to pay more for a vaccine, which may reflect differences in households' subjective perception of risk exposure to the disease. Respondents who had been educated were also willing to pay a higher amount for vaccination.

While evidence on household behavior when vaccines or other livestock health products are available to all is important, it is critical to understand household choices under real-world conditions. This gap in evidence needs to be addressed through research on livestock health choices made in non-intervention settings. It is also important to understand how individuals perceive livestock health products. For instance, if a decision-maker views treatment of a disease through antimicrobials (whether antimicrobials are an appropriate treatment for the disease or not) as a substitute for vaccination, the producer may choose not to vaccinate. While the study by Kairu-Wanyoike et al. (2014) is not a study of behavior *in the field*, their findings raise the possibility that individual characteristics—such as education level or wealth—may also influence livestock health choices. To help pastoralists and other smallholder livestock-keepers safeguard their livelihoods, it is important to understand what drives decision-making about livestock health behaviors and to investigate ways to promote choices that will help these households escape poverty.

Further Reading:

Gustafson, C. R., VanWormer, E., Kazwala, R., Makweta, A., Paul, G., Smith, W., & Mazet, J. A. (2015). Educating pastoralists and extension officers on diverse livestock diseases in a changing environment in Tanzania. *Pastoralism*, *5*(1), 1-12.

Kairu-Wanyoike, S. W., Kaitibie, S., Heffernan, C., Taylor, N. M., Gitau, G. K., Kiara, H., & McKeever, D. (2014). Willingness to pay for contagious bovine pleuropneumonia vaccination in Narok South District of Kenya. *Preventive Veterinary Medicine*, *115*(3), 130-142.

Rutabanzibwa, A. P. (2002). Veterinary legal reform in Tanzania. *Proceedings of Primary Animal Health Care in the 21st Century: Shaping the rules, policies and institutions,* Mombasa, Kenya.

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