Research Poster

Beefing Up Websites: A Content Analysis of Extension Websites' Vaccination Communication Efforts for Beef Producers

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Introduction

With beef production being an important U.S. agricultural commodity (USDA, 2024), it is crucial to ensure beef producers are providing safe and secure products for consumers. In 2009, 79% of the cattle industry was made up of small operations (less than 50 head) (National Cattlemen's Beef Association [NCBA], 2009). In 2023, NCBA reported that 96% of beef cattle operations were family owned and operated with the average herds totaling 44 head (NCBA, 2023). Since smaller beef cattle operations play an important role in beef production, it is crucial that the latest production research and information, especially vaccination information, is continually accessible by all beef producers, not only large producers or those in larger cattle producing states. Animal and Plant Health Inspection Service (APHIS) reported owners of small herds (1–49 head) were less likely to vaccinate their herds than operations with 50 head or more. Additionally, only 59.4% of small herds (1–49 head of cattle) were vaccinated (APHIS, 2009). While no recent vaccination rate reports exist, APHIS did find only 57% of cow-calf operations were vaccinating against bovine viral diarrhea (BVD) in 2017 (APHIS, 2023). These reports indicate a need for further communicating about the importance of vaccinating cattle. The Cooperative Extension Service (CES), adopted in 1914, provides farmers and ranchers the opportunity to utilize agricultural research with the possibility of improving methods to farming (U.S. Government Accountability Office [GAO], 1981). Through their existing efforts, vaccination information can be shared by CES to reach beef producers of all operation sizes.

Theoretical Framework

We used the Defining Advertising Goals for Measured Advertising Results (DAGMAR) theory (Colley, 1961). We adapted the utilization of the DAGMAR for this study from Arnold et al. (2012). The goal of DAGMAR is to set measurable outcomes for campaigns to determine message effectiveness. This is done by measuring human behavior as they navigate four stages of "consumer product acceptance" (Arnold et al., 2012, p. 4): awareness, comprehension, conviction, and action (Colley, 1961). After exposure to a message or idea, people can be found in any of the four stages. We specifically considered the awareness stage as the initial step for Extension systems to consider when communicating about vaccinations via their websites.

Methodology

The purpose of this research was to evaluate what vaccination information exists on Extension websites, determine if information was tailored for small-scale operations, and compare vaccination information shared on larger beef producing states websites versus smaller states. We used a quantitative content analysis to complete this study. We purposively sampled 10 websites from states who were not in the top 10 listed states for beef production (Data Pandas, 2023) to account for cattle producers who may not be in states with larger land masses to account for smaller cattle operations. Using the data list from Data Pandas (2023), we divided the ranked states into thirds. We sampled five states from the top portion of the middle third and five states from the bottom portion of the middle third. A priori codes were determined prior to sampling, based on an adapted codebook from Steede et al. (2019). Two coders independently coded 28 variables for each website. We completed coder training prior to coding using Extension websites outside the selected sample. Intercoder reliability was evaluated using Krippendorff's alpha (Hayes & Krippendorff, 2007). Variables below .667 (n=19) were recoded to improve

reliability (Riffe et al., 2014). Finals codes and agreements were reached through discussion and unanimous agreement.

Findings

We found that only 40% of the Extension websites had any information on vaccines. Of the four websites with vaccination information, all provided a definition of a vaccine in understandable terms. When considering herd health, only three of the 10 websites provided a definition of herd health, but not information for improving or maintaining herd health. Interestingly, seven of 10 websites provided the information of the state Extension specialists to contact with questions about cattle health. When looking to see if the websites provided trainings or workshops related to herd health, only one of 10 websites offered an event relating to vaccinations or vaccination protocols. Only one website mentioned anything about small beef cattle operations. Interestingly, zero of the websites mentioned large operations, indicating that Extension systems may not be distinguishing information between operation size. Additionally, zero websites provided training specific for small scale cattle producers. Two out of the five larger producing state websites had information provided on vaccines, and two out of the five smaller producing state websites had vaccination information listed. Three of the five larger state websites defined a vaccine, and only one of the five smaller state websites defined a vaccine. Two of the five large state websites defined herd health, but only one of the five smaller state websites defined herd health. One of the five larger operations mentioned small operations on their website, but zero of the five smaller state websites mentioned small operations. In total, neither the larger or smaller producing state websites specifically mentioned large operations. Additionally, neither group listed trainings for vaccinations for large or small operations.

Conclusions

Based on the data, sampled Extension websites are not effectively communicating the need for vaccinations and vaccination protocols for beef producers, large or small. Although some websites encourage producers to reach out, there is little or no information provided on vaccination themselves, limiting people from entering the awareness stage of "consumer product acceptance" (Arnold et al., 2012, p. 4). Information, when provided, was not designated to be used specifically by large- or small-scale producers, potentially limiting producers from adopting information if it does not fit within their perceived needs. This further emphasizes the need for awareness and comprehension stages found in DAGMAR (Colley, 1961). We noticed that states with reported larger operations provided more information about vaccinations when compared to the smaller producing state websites sampled. However, overall, we noted a lack of information available to any producer about vaccinations or recommended protocols, and Extension websites have many areas of improvement available when it comes to communicating about beef cattle vaccinations.

Implications and Recommendations

We recommend that Extension systems consider vaccination trainings for both large and small beef producers. Since most of the industry is composed of small operations, these producers are an audience who could benefit from basic and advanced vaccination trainings. These trainings, along with web communications about their availability, would place people in the awareness stage for the need of vaccination protocols. Additionally, Extension websites should be updated and adapted for usability. While the websites were easy to find using a search engine, they were not easy to navigate. Each website had a search bar, but making herd health information prominent and easier to find could allow producers to research information before being encouraged to reach out to Extension specialists creating more conviction for action.

References

Animal and Plant Health Inspection Service [APHIS]. (2009). Vaccination of cattle and cows on U.S. beef cow-calf operations. Information Sheet. https://www.aphis.usda.gov/sites/default/files/beef0708_is_genvacc_1.pdf

Animal and Plant Health Inspection Service [APHIS]. (2023). Bovine Viral Diarrhea on U.S. beef cow-calf operations NAHMS beef 2017 study. Information brief. https://www.aphis.usda.gov/sites/default/files/bvd-infobrief.pdf

Arnold, S., Hill, A., Bailey, N., & Meyers, C. (2012). Extension's Online Presence: Are land-grant universities promoting the tripartite mission?. *The Journal of Extension, 50*(6), Article 17. https://doi.org/10.34068/joe.50.06.17

Colley, R. H. (1961). Defining advertising goals for measured advertising results. New York: Association of National Advertisers.

Data Pandas. (2023). *Beef production by state. Number (#) of cattle.* https://www.datapandas.org/ranking/beef-production-by-state#

National Cattlemen's Beef Association [NCBA]. (2009). Cattle industry: Who we are. Fact sheet. https://competitivemarkets.com/wp-content/uploads/2017/04/factsheet_cattleindustrywhoweare-Number-of-cattle-producers-1.pdf

National Cattlemen's Beef Association [NCBA]. (2023). U.S. beef community fact sheet. https://www.ncba.org/Media/NCBAorg/Docs/industry-statistics-142024.pdf

Steede, G. M., Meyers, C., Li, N., Irlbeck, E., & Gearhart, S. (2019). A content analysis of antibiotic use in livestock in national US newspapers. *Journal of Applied Communications, 103(*1). https://doi.org/10.4148/1051-0834.2237

United States Department of Agriculture [USDA]. Economic Research Service. (2024). *Cattle and Beef. Sector at a Glance.* https://www.ers.usda.gov/topics/animal-products/cattle-beef/sector-at-a-glance/

United States General Accountability Office [GAO]. 1981. Cooperative Extension Service's mission and federal role need Congressional clarification. https://www.gao.gov/assets/ced-81-119.pdf