Animal Health Conversations and Social Media

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When events impacting animal health occur, there is great potential for financial losses or gains. For example, on March 5, 2017, the USDA announced the presence of HPAI in a commercial chicken flock in Tennessee (USDA, 2017). The impacted flock consisted of 73,500 birds. In 2017, the average liveweight of a U.S. broiler was 6.18 pounds and for the week ending on March 6, the average price was 87 cents per pound (National Chicken Council, 2011) (USDA, 2017). By these averages, the birds in the compromised flock had a market value over 3.95 million dollars. Within days, 27 countries and the European Union temporarily banned imports of poultry from Lincoln County, Tennessee, the site of the outbreak, with several of the countries instituting bans from broader regions within the U.S., likely negatively impacting the profits of some disease-free poultry operations (AgNet West, 2017). Over the following twenty days, an additional case of HPAI in a poultry flock was discovered in Tennessee, as well as occurrences of low pathogenicity avian influenza (LPAI) in Alabama, Kentucky, and Georgia (USDA, 2017).

Due to the potential financial implications of events that impact animal health and welfare, there is an incentive to monitor consumer sentiment about such events. If players in the animal production industry are able to gain insight into consumer reactions, there is potential to craft response plans that target the specific concerns of consumers. However, if the cost to obtain data on consumer sentiment is high, any benefits from increased information may be negated.

Social media platforms have continued to rise in prominence. Launched in 2006, Twitter boasted 65 million monthly users in the U.S. a just decade later (Newberry, 2016). As Twitter has risen in popularity, researchers have recognized the potential for capturing information users are self-reporting about their beliefs and preferences.

While Twitter data is a relatively new and exciting way to monitor consumer sentiment, the costs of data access can be much higher than for traditional print media, thus there is an incentive to test the exchangeability of traditional print media data for Twitter data in studies attempting to capture information about market or consumer behavior through media.

To compare Twitter to traditional print media, data was collected from Sysomos, a social media analytics firm, and LexisNexis, a research database. Tweets and articles mentioning porcine epidemic diarrhea virus (PEDV) and highly pathogenic avian influenza (HPAI) were downloaded, as well as results pertaining to respective topics and biosecurity, to capture discussion surrounding animal health. The collection period spanned from August 17, 2016 to July, 1, 2017.

Social media posts and news articles are published at a fast pace which poses the question: "How long is an article or post relevant to consumers?" A model was used to estimate the change in the sum of Tweets published on an observed day compared to the previous day, as explained by the change in the sum of Tweets published in the five proceeding days (Figure 1). This process was repeated for

LexisNexis articles (Figure 2). TLagOne through TLagFive represent the change in the sum of Tweets published one through five days earlier, respectively. LNLagOne through LNLagFive similarly represent lagged LexisNexis articles. The patterns show a mostly declining impact over the course of the five lagged days for both media sources, although the estimates do not reach zero nor become insignificant by the fifth lagged day, suggesting that impact of conversations pertaining to animal health events have a lifespan of at least five days.

The collection and analyzation of Twitter data will likely require advancements in efficiency and efficacy before becoming a valuable resource to many players in the agriculture industry. While it is still difficult to create a response plan only utilizing Twitter data, there is evidence of unique information available through social media about consumer thought, emotion, and preference, key drivers of demand.[i]

Figure 1 Absolute Twitter Decay
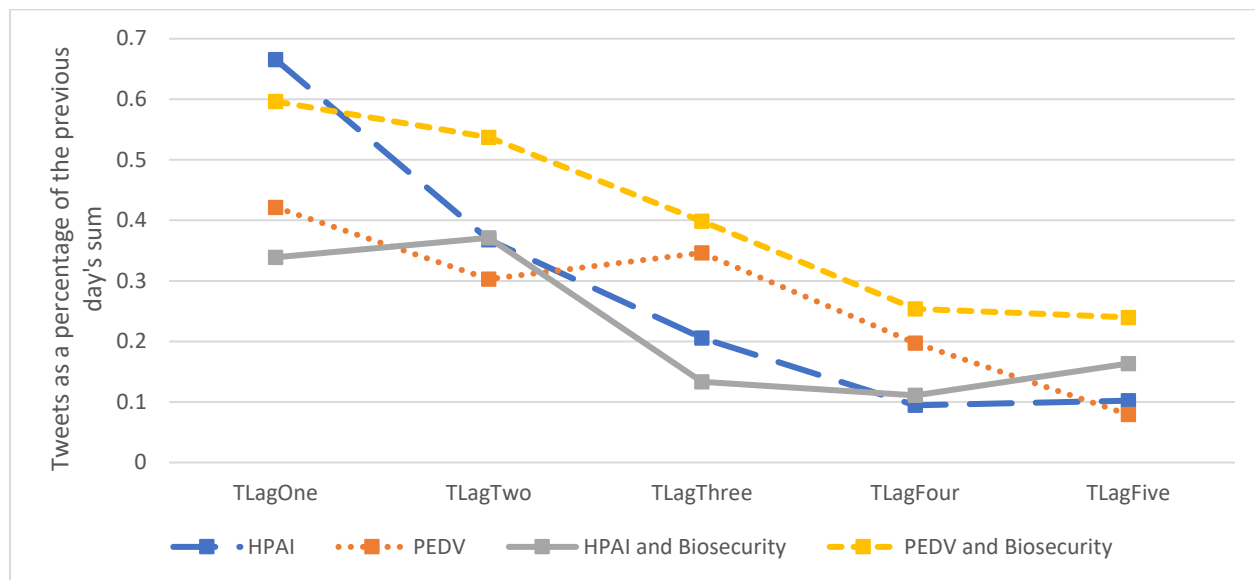
Figure 2 Absolute LexisNexis Decay
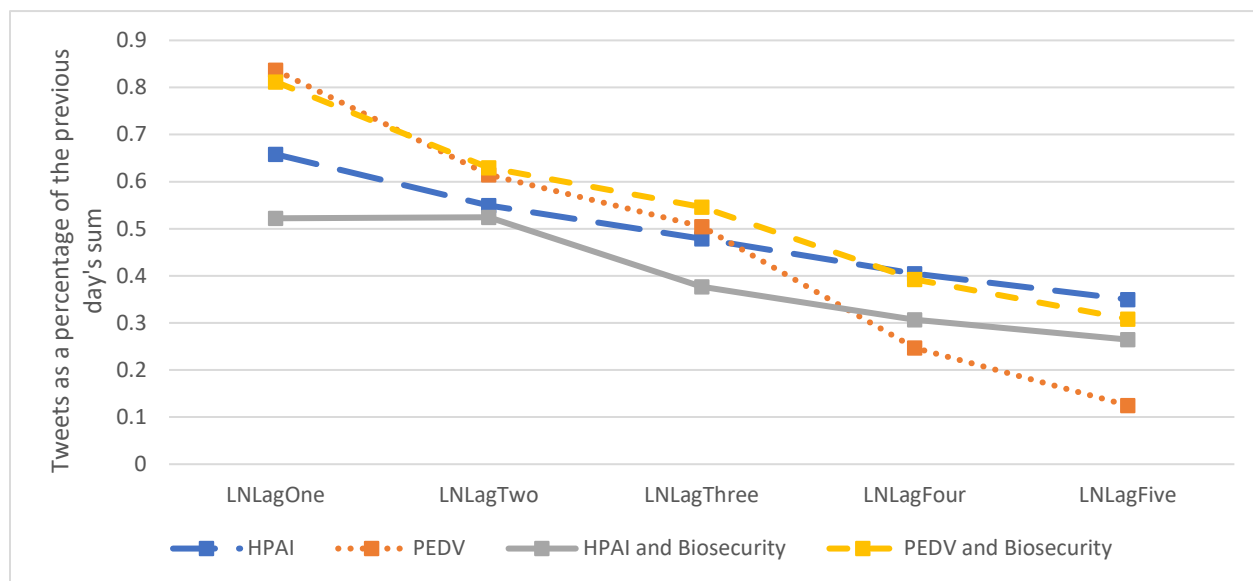
References

AgNet West. (2017, March 6). *USDA Confirms H7 Avian Influenza in Tennessee*. Retrieved from AgNet West: http://agnetwest.com/78592/

Gatson Smart, Candace. (2018). Evaluating Twitter as an Agricultural Economics Research Tool. http://krex.k-state.edu/dspace/handle/2097/39042

National Chicken Council. (2017, September 26). *U.S. Broiler Performance*. Retrieved from National Chicken Council: https://www.nationalchickencouncil.org/about-the-industry/statistics/u-s-broiler-performance/

Newberry, C. (2016, August 11). *Top Twitter Demographics That Matter to Social Media Marketers*. Retrieved from Hoot Suite: https://blog.hootsuite.com/twitter-demographics/

USDA. (2017). *Livestock, Dairy, and Poultry Outlook.* USDA.

USDA. (2017, March 15). *Livestock, Dairy, and Poultry Outlook*. Retrieved from USDA: https://www.ers.usda.gov/webdocs/publications/82850/ldp-m-273.pdf?v=42809

USDA. (2017, March 6). *USDA Confirms Highly Pathogenic H7 Avian Influenza in a Commercial Flock in Lincoln County, Tennessee*. Retrieved from USDA Animal and Plant Health Inspection Service : https://www.aphis.usda.gov/aphis/newsroom/news/sa_by_date/sa-2017/hpai-tn

[i] For more information on the topic of Twitter data as it pertains to animal health and the food industry, please see *Evaluating Twitter as an Agricultural Economics Research Tool* (Gatson Smart, 2018).