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Analysis of pet food buyers' perception of plant-based ingredients: Evidence of consumer survey

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Abstract details:

The United States pet food market has grown at over 4% annually, reaching an estimated US\$57 billion in 2023. The emerging trend of perceiving pets as family members has transformed the landscape of pet care and raised the standards for food quality, presenting both challenges and opportunities within the pet food industry (Boya *et al.*, 2012). The recent surge in the pet population in the United States has notably elevated the importance of the pet food market and consumer preferences, capturing the attention of decision-makers in the agribusiness sector (Zhang, Cao and Lin, 2022). Plant-based ingredients such as rice, wheat, corn and soybean play an important role in pet food production; however, some commodities including sorghum are believed to have a significant untapped potential as an ingredient in pet food.

During the 2021/22 season, the U.S. topped the world in sorghum production with an output of about 11.4 million metric tons (Statista, 2023). Furthermore, in 2022, the United States held the position as the top exporter of sorghum, shipping nearly 4.7 million metric tons globally (Statista, 2023). While sorghum has been used in pet foods for decades, the growth has been slow and has not kept pace with other "novel" ingredients like peas and potatoes. With recent changes in market trends and consumer preferences, there has been a surge in interest in heritage or heirloom grains as ingredients in pet food. Among pet food attributes that are gaining increased interest in the market are health/wellness benefits, nutritional benefits, taste and texture, sustainability, and country of origin. Given the adaptability to arid climates and productivity, nutritional profile, lower glycemic index, established domestic production base, and many other characteristics, sorghum may be an excellent fit for companies attempting to capitalize on emerging market trends. However, due to a disproportionately large focus on technical research and a lack of consumer studies, there is a limited understanding of needs and perceptions among pet food buyers regarding the sorghum as an ingredient. Although there is increasing interest among industry decision-makers, the body of literature on the management and economics of pet food is still relatively sparse.

This study aims to fill this knowledge gap by leveraging a unique dataset from a primary survey of 6,310 U.S. pet food buyers and employing innovative machine learning methods to accomplish the following goals: Examine dog food buyers' perception of the relative importance of plant-based ingredients including sorghum as an ingredient in pet food; examine dog food buyers' perception of various benefits



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of sorghum as an ingredient in pet food; and discuss implications for agribusiness industry decision makers including pet food manufacturers, sorghum producers, as well as policy makers.

To gain improved understanding of pet owners' perceptions about sorghum in pet food and preferences for select pet food attributes, a consumer survey is designed and conducted. The U.S. dog owners are selected as the population of inference due to the large share of dog food in the overall pet food market and the higher potential of sorghum use in dog food. A sample size of 5,000 dog owners was determined for the survey to be appropriate for statistical inference. A detailed consumer survey questionnaire was designed to include 50 questions regarding (i) dog owner demographics (e.g., gender, age, income, education, location, etc.), (ii) pet characteristics (e.g., number of dogs, breed, age, weight, sex and reproductive status, body condition, etc.), (iii) current pet food feeding habits (e.g., food allergies, food and treat type, frequency and amount of feeding, brand name and formulation of primary food and treats, monthly expense on food and treats, dog's activity level, etc.), (iv) current pet food buying habits (e.g., preferences for price, health, ingredient, processing and supply chain attributes/claims, etc.), (v) perceptions of sorghum as pet food ingredient (e.g., preference among a set of plant-based ingredients, perceptions of importance of sorghum as an ingredient in pet food/treats, factors considered as most and least important benefits of sorghum as an ingredient in pet food, and interest in learning more about sorghum as an ingredient in pet food/treat, etc.).

The preliminary analysis of the data from the survey of over 5,000 respondents representing dog food buyers in the U.S. revealed several key insights about their perception of sorghum as an ingredient in pet food. First, when choosing between two pet food products/brands the most preferred criteria is ingredients followed by price. Among the most important dog food attributes/claims are digestive tract health, joint health/mobility, "Natural," "Made in USA," "Eco-friendly" and "Sustainable." This indicates that there is a significant untapped potential for sorghum as an ingredient in pet food, given it is non-GMO, has a substantial U.S.-based production capacity, as well as a health-conducive nutritional profile and favorable digestibility characteristics. Second, the data on pet food buyers' perception of relative importance/ranking of sorghum's benefits as a pet food ingredient reveals that "Healthy Weight," "Antioxidant Rich" and "Functional Fiber" are the top three benefits as perceived by pet food buyers. However, there is generally limited consumer awareness of sorghum's benefits and its potential as a pet food ingredient, as evidenced by relative rankings of plant-based ingredients and respondents' perception of sorghum's importance as a pet food ingredient. Third, around one-third of respondents expressed interest or extreme interest in learning about sorghum's potential as an ingredient in pet food. Interestingly, the respondents that indicated extreme interest in learning about sorghum as a pet food ingredient have the highest average monthly expenditure on pet food compared to those who are not interested, somewhat interested or interested. Fourth, among the pet food buyers whose dogs have food allergies the proportion of those who perceive sorghum as an extremely important pet food ingredient and are interested to learn more about it is the highest.