Sensory analysis and acceptance of dry dog food manufactured with sorghum



Brizio Di Donfrancesco,[1*] Kadri Koppel,[1] Greg Aldrich [2]

[1] *Department of Food, Nutrition, Dietetics and Health*

[2] *Department of Grain Science and Industry*

**Email: briziod@ksu.edu*

Introduction

- Kansas is the top producer of sorghum in the US.
- This crop grows well in arid climates with lower water requirements.
- To increase the use of sorghum, industries such as pet food can be targeted. To do this, understanding aspects such as sensory properties, pet owners' acceptance, and pets' acceptance of the final products is essential.

Objective

- The objectives of this study were to investigate the sensory profile of dry dog food containing sorghum, the pet owners' liking, and and to investigate dogs' acceptance of these products.

Materials and Methods

- Three samples containing different sorghum fractions and a control sample containing mixed grains were manufactured (Table 1).
- A trained human descriptive sensory panel described the sensory characteristics of the samples.
- A total of 105 pet owners evaluated the samples for appearance, color, aroma and overall liking in a Central Location Test (CLT).
- In addition, a total of 30 dogs of different size, age and breed were selected for a one-bowl in-home palatability study to test pet acceptance of samples.
- The dogs were served each of the foods for 5 consecutive days in a randomized order.



CD



WSD



FD



MF

KANSAS STATE UNIVERSITY

Materials and Methods

- o CD (Control diet: Rice, Corn, Wheat)
- o WSD (Whole sorghum diet)
- o FD (Flour diet)
- o MF (sorghum bran enriched mill feed diet: bran, germ, red dogs)
- Additionally all samples contained Chicken by-product meal, Corn Gluten meal, Chicken fat, Beet pulp, Anti-oxidant, Vitamins and Minerals

%	CD	WSD	FD	MF
Rice	**21.2**	0.00	0.00	0.00
Corn	**21.2**	0.00	0.00	0.00
Wheat	**21.2**	0.00	0.00	0.00
Sorghum	0.00	**64.69**	0.00	0.00
Sorghum bran	0.00	0.00	0.00	**67.65**
Sorghum flour	0.00	0.00	**62.31**	0.00

Table 1. Samples Grain inclusion

Results

Descriptive Analysis

- Differences among samples from the descriptive analysis were small and mostly related to the appearance and texture of the samples.
- Samples manufactured with sorghum and the control sample had similar flavor and aroma profiles.

Consumer Test

- The CLT indicated that the Whole Sorghum and the Control samples were the most liked samples overall as well as for overall appearance and color. Results
- No difference was detected for aroma liking.

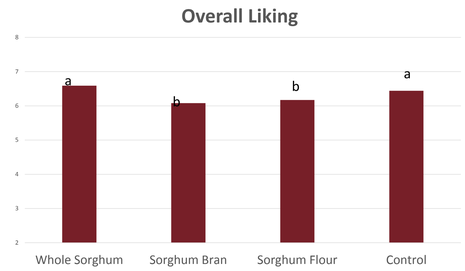
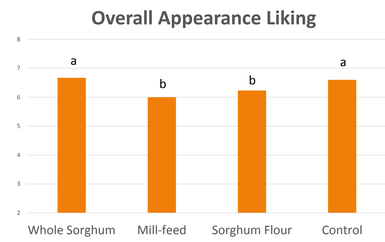


Fig 3 – Consumer Acceptance scores (1-9 point hedonic scale) for Overall Liking. Different letter indicates statistically different value

Results



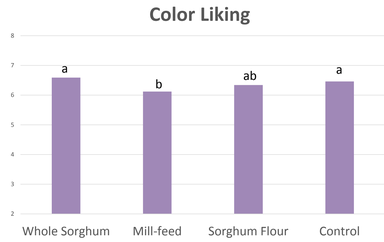


Fig 4 – Consumer Acceptance scores (1-9 hedonic scale) for Overall Appearance and Color Liking. Different letter indicates statistically different value.

Palatability Test

- The palatability study with dogs showed no significant difference in dogs' acceptance between control and sorghum samples.

Sample	Intake (%)
CD	57.06
MF	57.50
FD	53.44
WSD	55.62
p-value	*0.1729*

Table 3. Food intake (One-bowl test) – no significant difference (α=0.05)

Conclusions

- The results from this study indicated that sorghum has no major effect on flavor or aroma properties of extruded dog foods.
- Results indicate the slight difference in liking scores among the samples are due to the different appearance of the samples and not to the aroma characteristics as also found by Di Donfrancesco et al. (2014).
- The Whole Sorghum diet was accepted at the same level as the Control diet. The differences in liking for the other sorghum samples were significant but not large indicating the possibility of a higher consumer acceptance if the product for appearance characteristics are improved.
- Furthermore, the dogs seemed to like the foods manufactured with sorghum and other grains equally.
- In conclusion, these results encourage the use of sorghum in dry dog food products.

Acknowledgements

- Funded by Sorghum Checkoff Program

References

- Di Donfrancesco, B., Koppel, K., Swaney-Stueve, M., Chambers, E., IV. 2014. Consumer acceptance of dry dog food variations. *Animals (MDPI)* 4 (*2),* 313-330.