Ranking of Dog Preference for Various Cooked Meats

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Introduction

- The last research on dog preference for various meats was conducted in 1974 by Lohse and has not been revisited over the years.
- An innovative dog preference ranking procedure was recently proposed (Li et al. 2017). It relies on the motivation of dogs to extract food from a puzzle-toy by aroma/flavor preference. However, this method has only been tested on baked treats previously.

Objectives

- To confirm the reliability of the method on various meats
- To investigate possible meat aroma characteristics that affect dogs' liking.

Materials and Methods

Preference Ranking Test for Dog

1. Subjects
- **12 beagle dogs** from the Large Animal Research Center, Kansas State University were used in the study.
- Each dog was brought to the testing room next to their pens between 4 p.m. and 6 p.m. every day during the study.

2. Meat samples
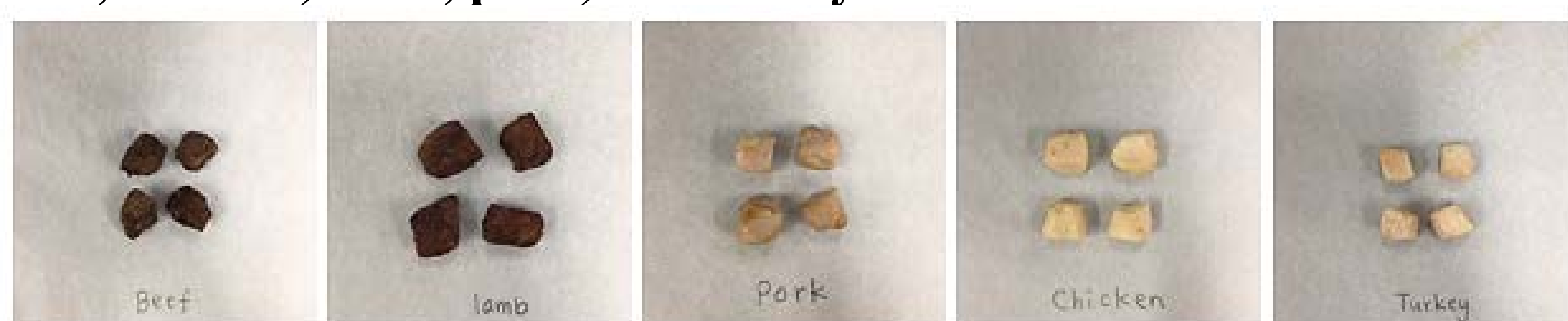- Five different types of ½ inch cooked meat cubes were prepared: **beef, chicken, lamb, pork, and turkey.**

Fig. 1. Cooked meat cubes: beef, lamb, pork, chicken and turkey.

3. Preference Ranking Procedure
- Each dog was served with five different cooked meat cubes in coded puzzle-toys for five continuous days during the study.
- The puzzle-toys with meat cubes were sniffed by dogs randomly before the test, and then placed in randomized order in a row on the floor.
- Each dog was brought to a start-point approximately 2m from the puzzle-toys by the researcher before the ranking test, then being released to reach and extract the meats in the puzzle-toys (Fig. 2.) The order of dogs was randomized during the test.
- The order and time of meat selection by dogs were recorded in the test, where the order of meat being extracted was considered as the preference ranking order.
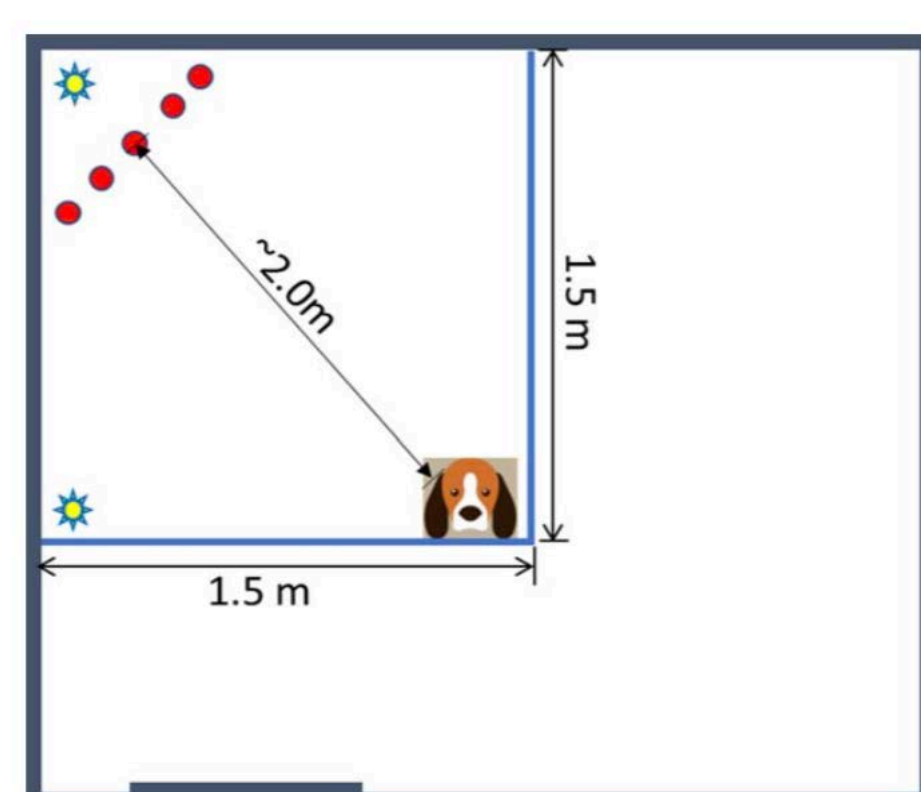

Fig. 2. Example for the arrangement of the testing space during the ranking procedure (Li et al., 2017). Blue lines: the space for the ranking test, red dots: the placement of puzzle-toys with meats, stars: the camera for video recording, dog icon: the start point of the ranking procedure.

Descriptive Analysis --- Meat Aroma Profiling

- Five different types of ½ inches cooked meat cubes (beef, lamb, pork, chicken, and turkey) were prepared as the same method in *"Preference Ranking Test for Dog"*.
- Three meat cubes were served in a medium snifter for each meat sample.
- 11 aroma attributes were generated according to the cooked meat samples during 2 days of orientations (1.5 hour per day).
- Four highly trained panelists listed the aromas perceived of each meat sample, and scored the intensity of aroma attributes using a consensus method.
- A 0-15 scale with 0.5 increments was used, where 0 meant none and 15 meant extremely high intensity.

Statistical Analysis

- Using XLSTAT, the Friedman test was conducted to analyze the ranking order of cooked meats preferred by dogs
- XLSTAT was used to understand the drivers of liking of cooked meats.
  - Principle component analysis was conducted to visualize the relationships among meats and aroma attributes.
  - The average rank orders were reversed to preference scores serving as supplementary variables in the principle component analysis.

Results and Discussions

Table 1. The rank order of dog preference of cooked meat (1-most preferred, 5- least preferred).

Rank Order	Types of Cooked Meat				
	Beef	Chicken	Lamb	Pork	Turkey
Average	2.3[a]	3.3[b]	3.0[ab]	3.5[b]	3.0[ab]

* Within a row, samples with different letters were significantly different ($p<0.05$).

- Beef was preferred over chicken and pork.
- This result was consistent with previous study where cooked beef was preferred over canned beef and canned chicken (Lohse,1974).
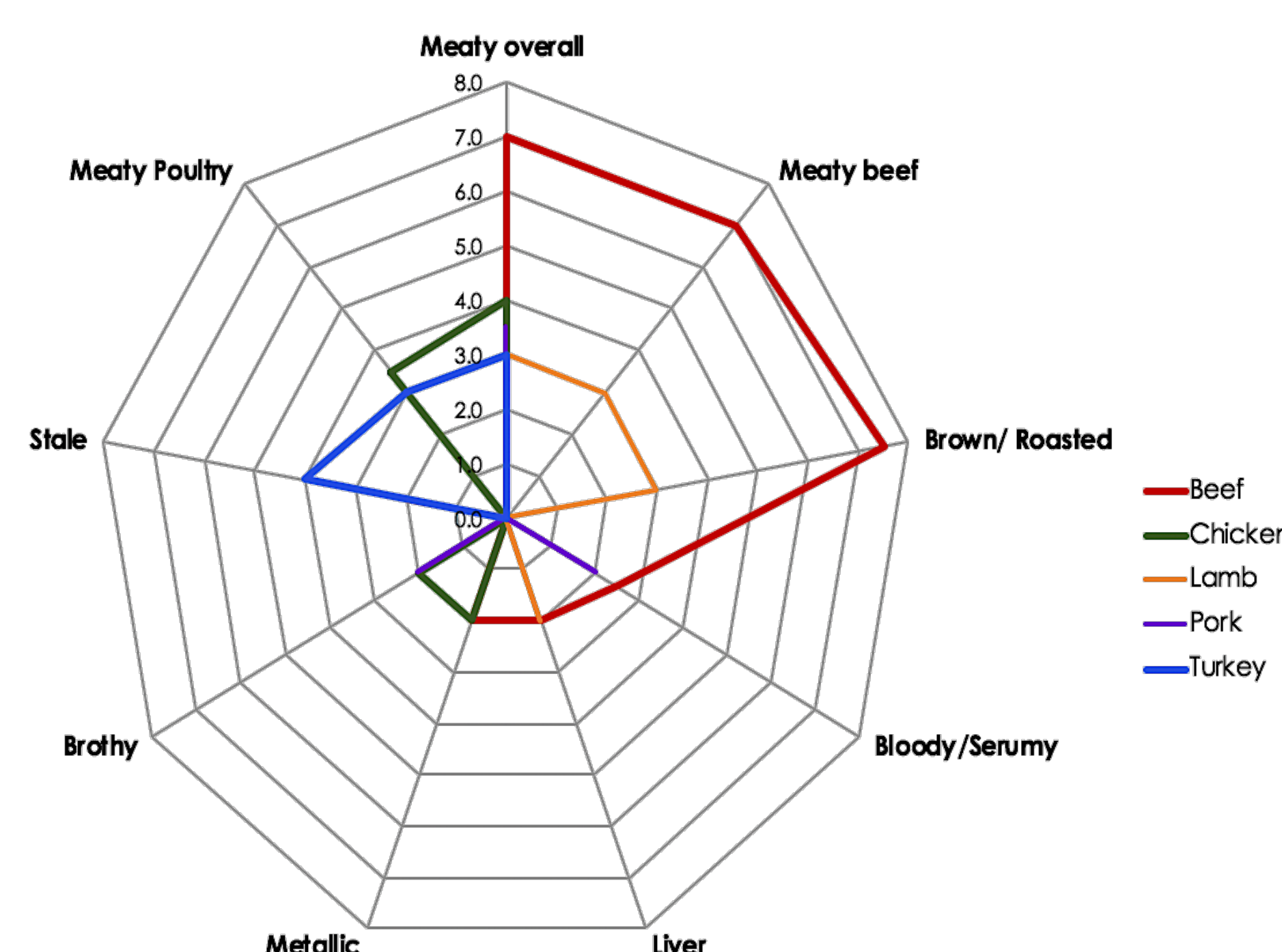

Fig. 3. The aroma profile of different cooked meats. A 0-15 point scale with 0.5 increments were used where 0: no intensity and 15: the highest intensity score.

- Beef had the most complex aroma profile with 6 attributes, and received the highest intensity score of meaty overall followed by chicken and pork.
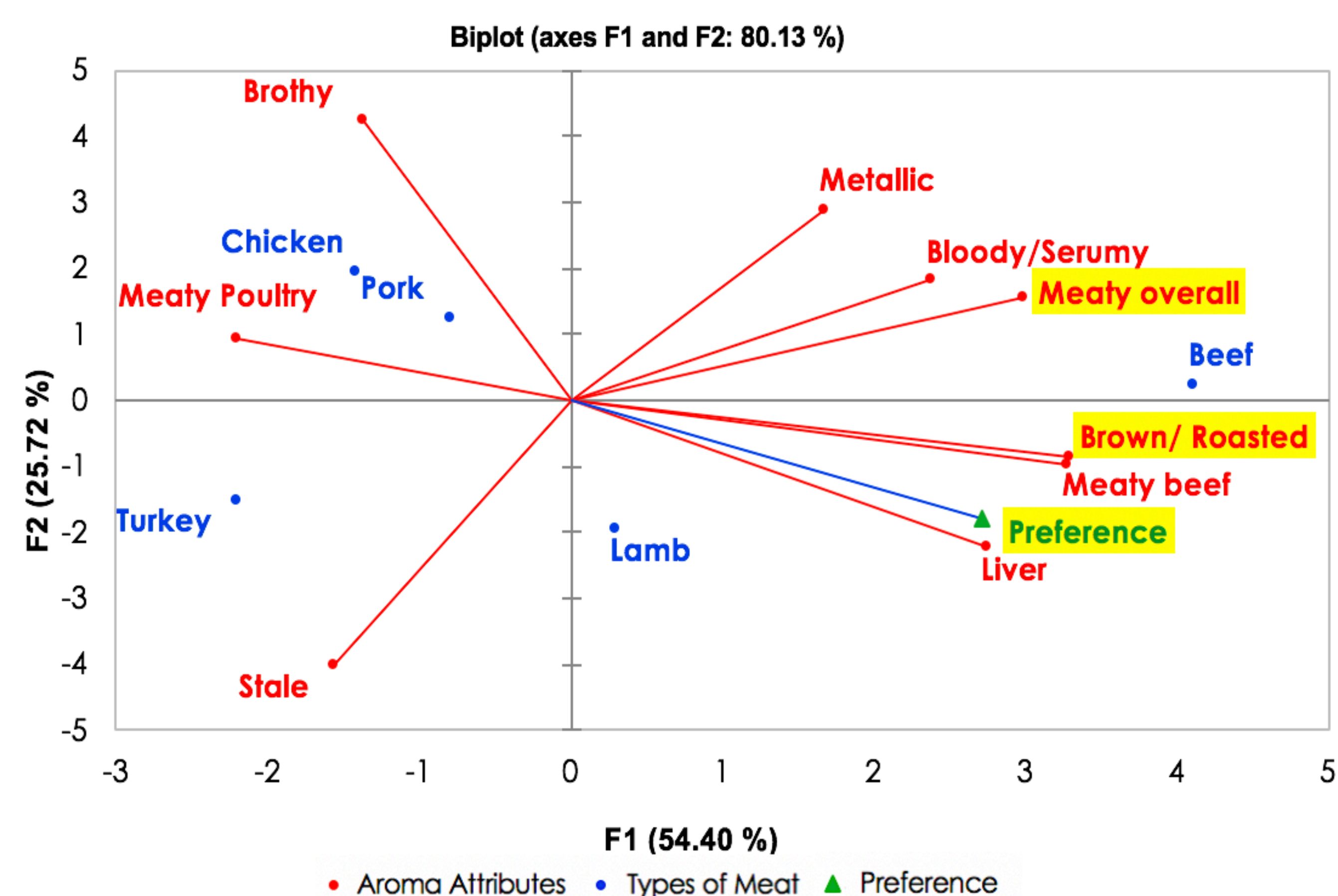

Fig. 4. Drivers analysis between meat aroma attributes and meat preference of dogs.

- Beef with higher intensity scores in meaty overall and brown/ roasted were most preferred among cooked meats.
- Dogs' preference toward cooked meat was highly correlated with 'meaty overall' and 'brown/ roasted' aroma.

Conclusions

- This study showed that dogs previously naïve to cooked meat cubes were able to rank their meat preferences based on aroma by this preference ranking procedure.
- Significant differences were found for the meat preferences, in which beef was preferred over chicken and pork.
- Specific cooked meat aroma characteristics such as meaty overall aroma could be a possible indicator for dogs' preference toward cooked meat.

References

- Lohse, C.L. (1974). Preferences of dogs for various meats. J. American Anim Hospital Association. 10:187-192.
- Li, H., Smith, S., Aldrich, G., & Koppel, K. (2017). Preference ranking procedure proposal for dogs: A preliminary study. J. Sensory Studies. 33: e12307, https://doi.org/10.1111/joss.12307.