

# Moisture impact on kibble parameters and dog's sensory perception

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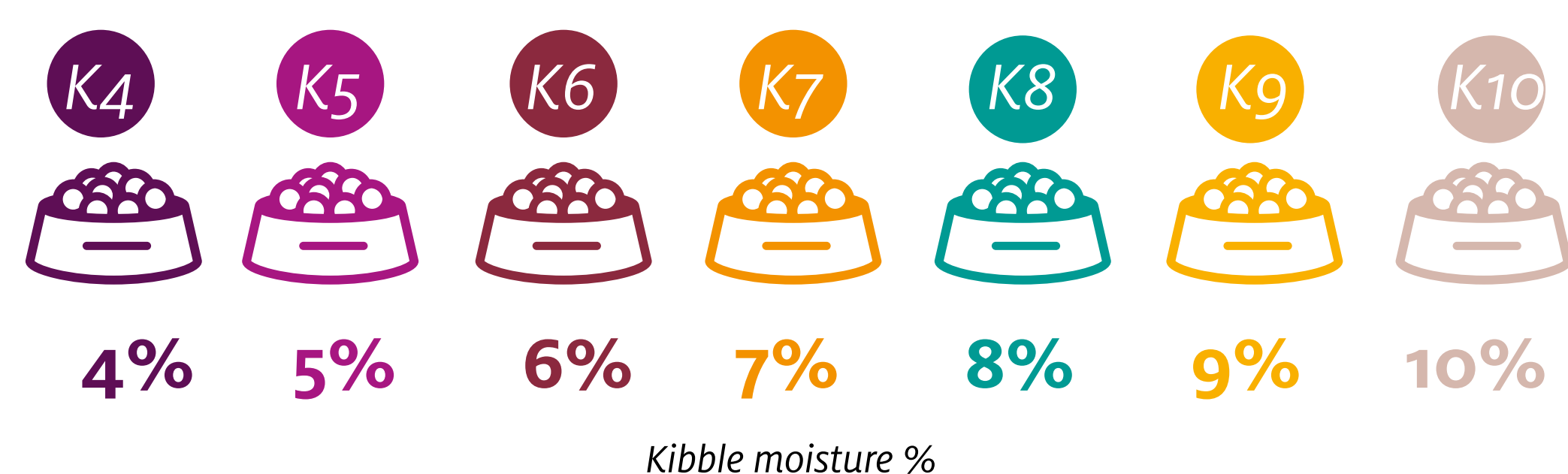
## Introduction

In the pet food industry, it is widely known that moistest kibbles are more palatable for dogs. How does it work? Which kibble's parameters are modified by water content? This study compares palatability, textural parameters and volatile profiles of dog kibbles with different levels of moisture.

## Material & methods

### Kibbles

- 7 dog kibbles dried to reach water contents ranging from 4 to 10%
- All kibbles coated with 6% fat and 2% liquid premium palatant



### Palatability tests

- 36 dogs
- 5 days
- 2 bowls preference test - 1<sup>st</sup> choice and intake ratio measured
- All kibbles compared to kibble K7.

### Textural analysis

- Texture of kibbles studied through shearing measurement (TAPlus, LLOYD Instruments).
- Results analyzed with PCA and HCA with Ward criteria

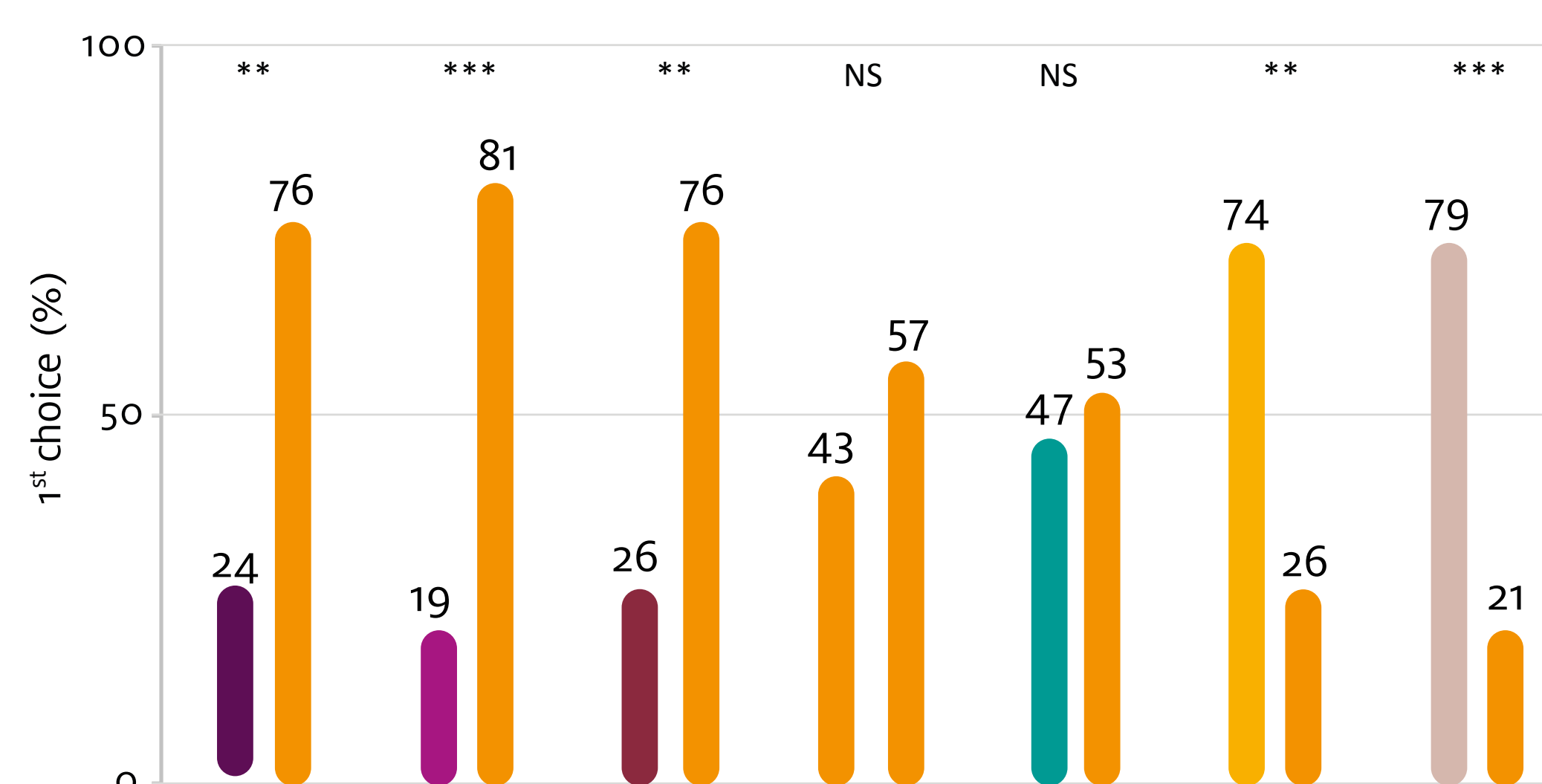
### Volatile profiles analysis

- Kibbles's volatile compounds extracted with HS-SPME (DVB/CAR/PDMS fiber) technique and analyzed with GC-MS/FID.
- Identified volatile compounds grouped together depending on their chemical class.
- PCA and HCA performed on peak area.

## Results & discussion

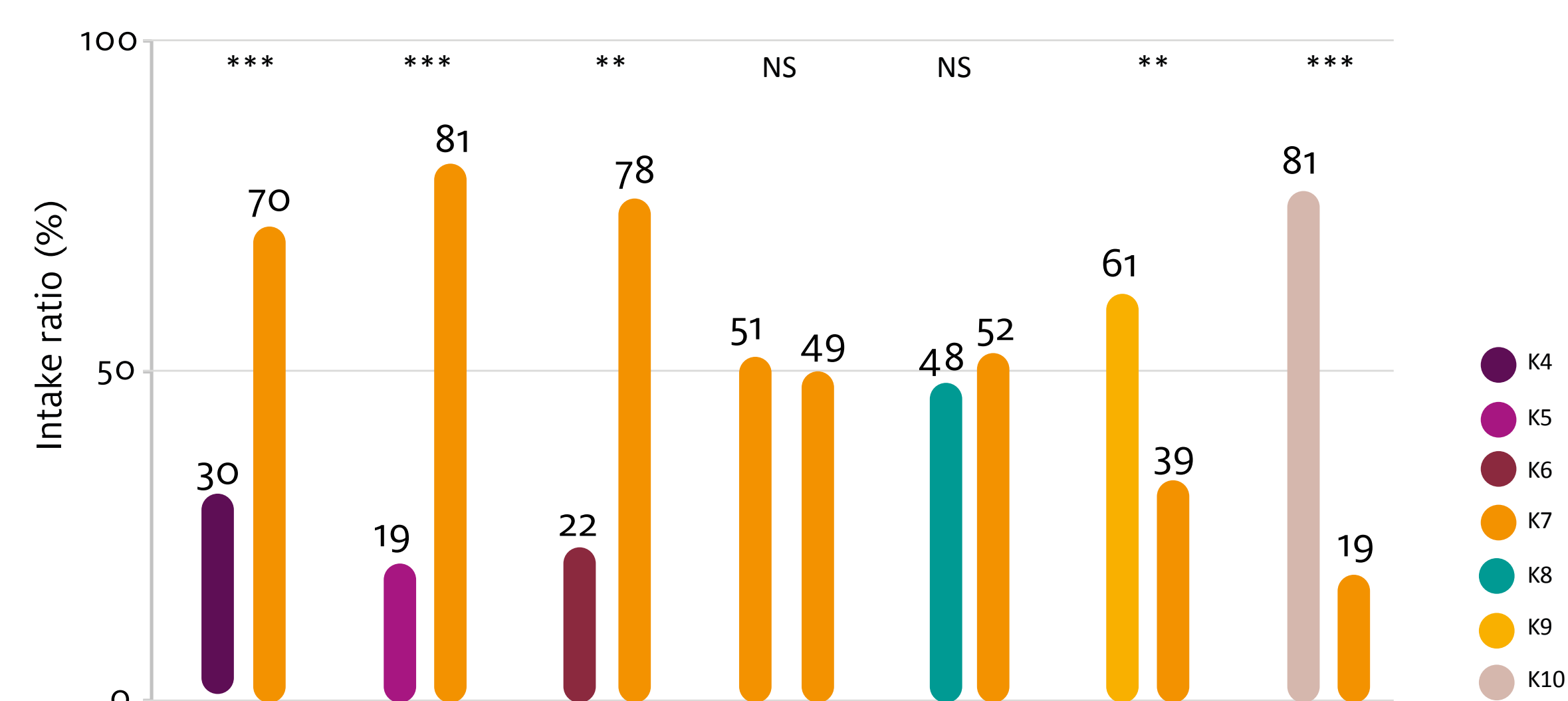
### Palatability

#### Impact of kibble's humidity on dog's preference



\*\* : Highly significant (p<1%); \*\*\* : very highly significant (p<0.01%)

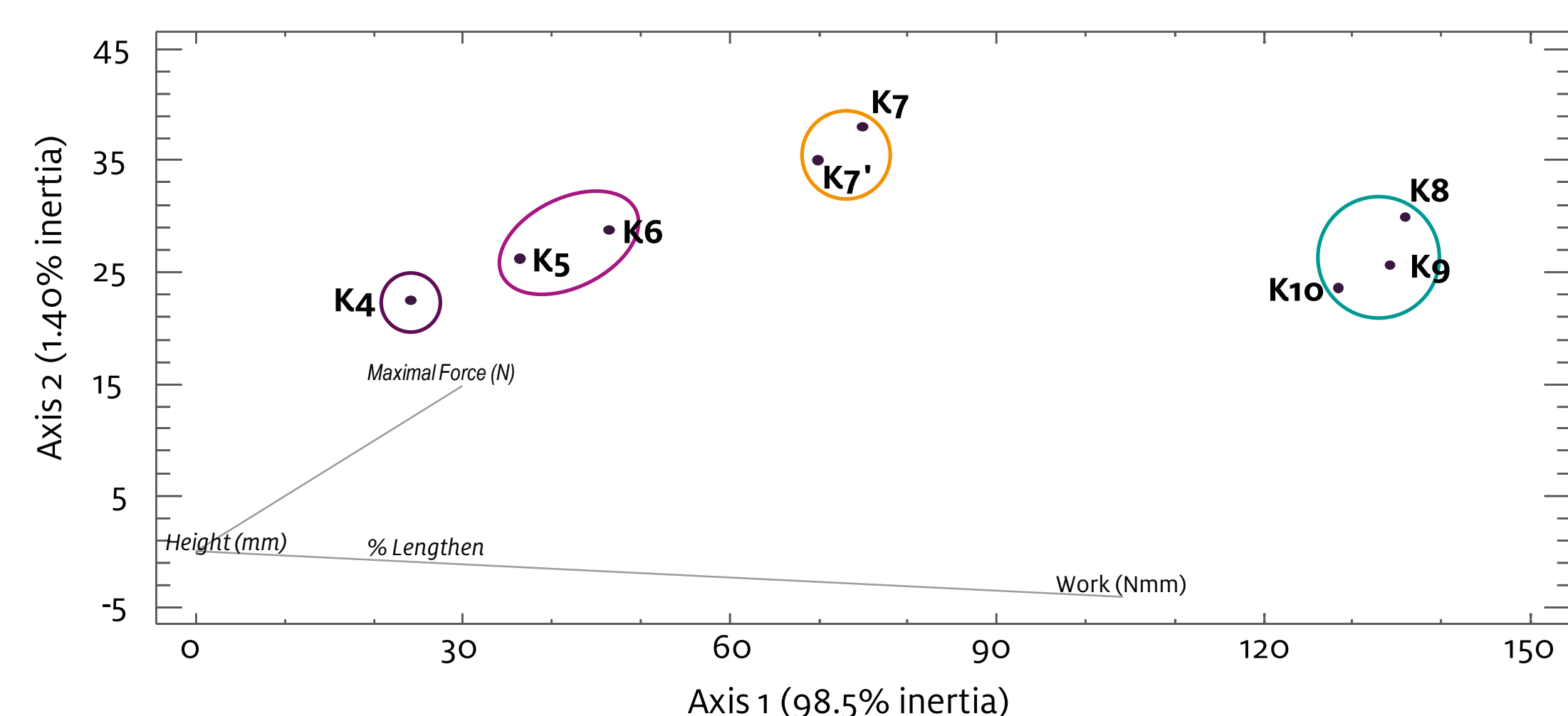
- Dogs significantly preferred moistest kibbles
- Dogs mostly selected moistest kibbles first, suggesting a modification of volatile profiles induced by water content, and impacting dog's food selection.
- Preference for moistest kibbles was confirmed by consumption ratio, suggesting that textural properties may also be modified by water content.



### Texture

#### Impact of humidity on kibble's textural profile

PCA of shearing results on coated kibbles with different moisture

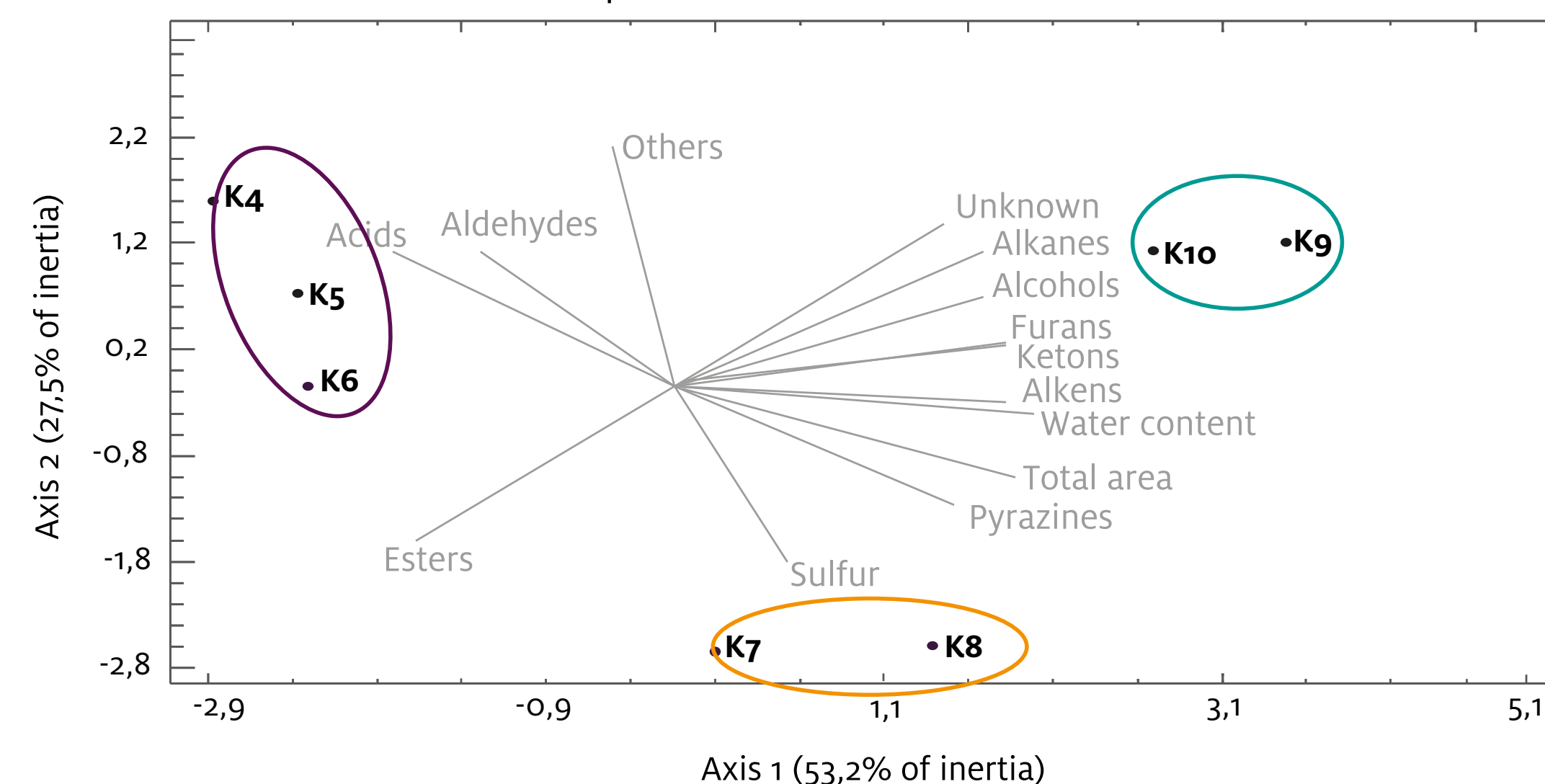


- Driest kibbles were harder than moistest ones which need more work to break.

### Volatile profiles

#### Impact of humidity on kibble's volatile profiles

PCA on volatile compounds area on coated kibbles with different moisture



- The release of volatile compounds increased together with kibbles' water content.
- Moistest kibbles profiles contained more ketons, alcohols, pyrazines and furans than driest kibbles which contain more acids, esters and aldehydes.

## Conclusion

Results confirmed dog's preference for kibbles with higher moistures. They demonstrated that water content significantly impacted textural properties and volatile profiles of kibbles. Water increased elasticity and probably porosity of the kibbles, leading to a higher release of volatiles, thus a better palatability. Water content, texture and palatability being highly correlated, additional researches combining sensorial, physico-chemical and textural analysis should be conducted to better understand volatiles release mechanisms and impact on palatability. Textural studies on kibble porosity and water location and behavior in the kibble would be particularly relevant.

Reference: Dalla-Rosa et al, 1994. Influence of water activity on headspace concentration of volatiles over model and food systems. Ital.J.Food.Sci.n 4