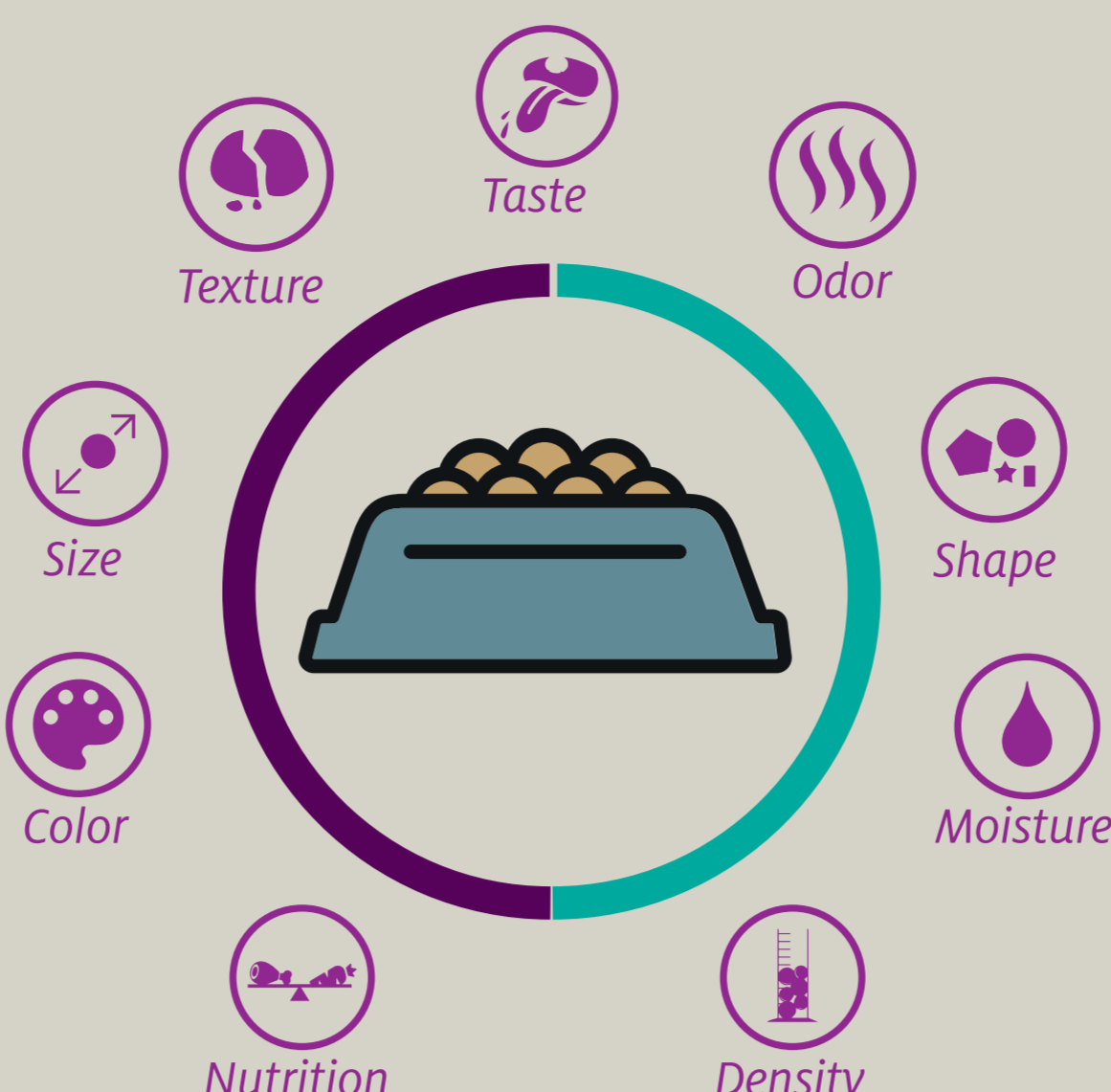


From food selection to prehension and mastication, eating is a dynamic sensorial cascade. At each step of the meal, different organoleptic attributes of the food such as odor, taste, and texture stimulate the senses of pets in different ways.



With specific sensory equipment and anatomy, cats and dogs **don't behave the same when facing food...**



1 to 3 large meals per day

1

## APPROACH



2 to 15 small meals per day

- Sniffs, chooses and eats food rapidly.
- Generally sticks to first choice when faced with several foods.

- Sniffs, hesitates, takes time before eating.
- Can change mind several times when faced with several foods.

### [SMELL]

Cats and dogs have a very sensitive sense of smell. Both are much more sensitive to odors than humans.

#### DOG SENSORIAL & ANATOMICAL EQUIPMENT

**200** million olfactory neurons  
**10%** of the brain dedicated to olfaction  
% of total weight



#### CAT SENSORIAL & ANATOMICAL EQUIPMENT

**67** million olfactory neurons  
**6%** of the brain dedicated to olfaction  
% of total weight



#### HUMAN SENSORIAL & ANATOMICAL EQUIPMENT

**15** Million olfactory neurons  
**0,3%** of the brain dedicated to olfaction  
% of total weight

### [VISION]

Cats and dogs have limited perception of colors and have difficulty seeing anything close to them. However, they can distinguish objects and shapes, and they have better night vision.

**3** million cones / **200** million rods\*  
**2 colors range** perception



**3** million cones / **200** million rods\*  
**2 colors range** perception

**7** million cones / **120** million rods  
**Trichromatic** color perception

\* Cones and rods are photoreceptors found in the retina. Cones work in full light and allow colors to be seen. Rods work in low light and allow visualization of white and black.

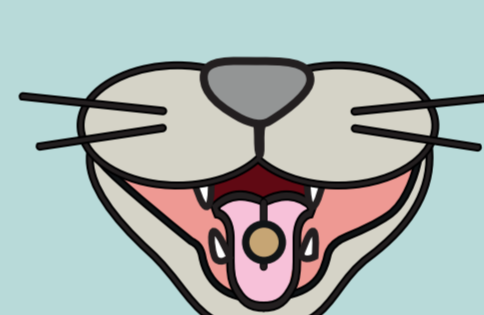
2

## PREHENSION

- Generally uses teeth to pick up food.
- Takes 1 to 7 kibbles per bite (depending on size of dog and kibble).



- Catches food with tongue or teeth or lips.
- Takes 1 to 2 kibbles per bite.

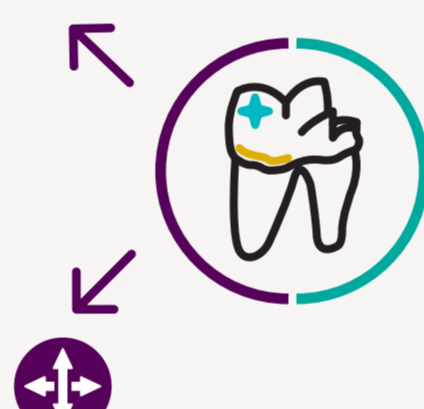


### [JAWS & TEETH]

The mobility of canine jaws and the profile of their teeth allow dogs to chew food as humans do. Cats, however, have limited jaw movement and fewer molars and premolars, so they can only shear and break kibbles.

#### DOG SENSORIAL & ANATOMICAL EQUIPMENT

**42** teeth  
**10** molars and **16** premolars  
**Vertical + horizontal** jaw movements  
Breaking + Shearing + Grinding



#### CAT SENSORIAL & ANATOMICAL EQUIPMENT

**30** teeth  
**4** molars and **10** premolars  
**Only vertical** jaw movements  
Breaking + Shearing



#### HUMAN SENSORIAL & ANATOMICAL EQUIPMENT

**32** Teeth  
**12** molars and **8** premolars  
**Vertical + horizontal** jaws movements  
Breaking + Shearing + Grinding

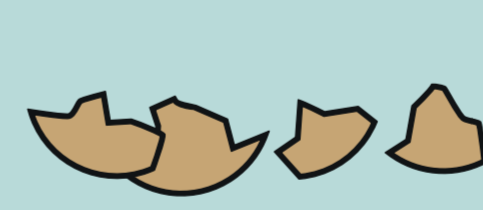
3

## MASTICATION

- Swallows directly or grinds kibbles with teeth.



- Swallows directly or rolls kibble with tongue toward molars to break kibble into small pieces.



### [TASTE]

Unlike cats, who lack the receptor for sweetness, dogs can detect the same five tastes as humans.

#### DOG SENSORIAL & ANATOMICAL EQUIPMENT

**1600** taste buds  
Can detect the **5** tastes  
Sour Bitter Salty Sweet Umami



#### CAT SENSORIAL & ANATOMICAL EQUIPMENT

**473** taste buds  
**Unable** to sense sugars  
Sour Bitter Salty Sweet Umami

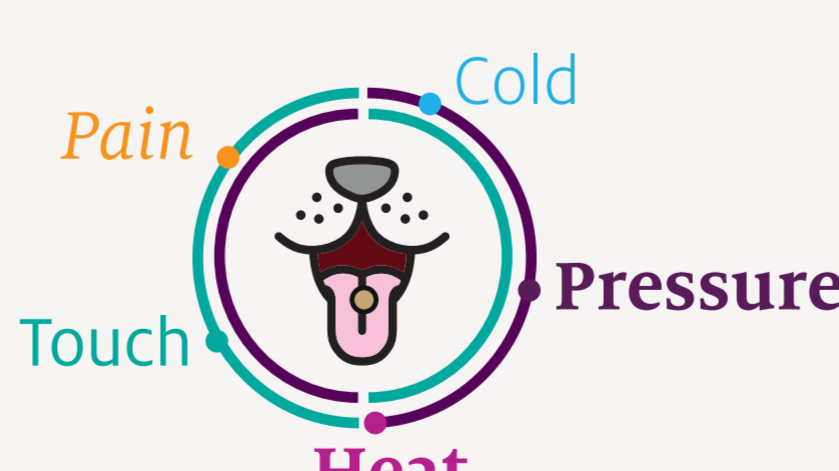


#### HUMAN SENSORIAL & ANATOMICAL EQUIPMENT

**9 000** Taste buds  
Sour  
Bitter  
Salty  
Sweet  
Umami

### [SOMESTHESIA]

Somesthesia is the perception of bodily sensations coming from sensory inputs of touch, pressure, cold, heat, and pain.



The mouths of cats, dogs and humans are all equipped with the sensorial receptors and neurons required to perceive these inputs.

#### Sources

- Abrantes R., Do dogs see colors? What does it mean for our training? 2014, <https://ethology.eu/the-dogs-color-vision-and-what-it-means-for-our-training/>
- Ache, B.W., & Young, J.M. 2005. Olfaction: diverse species, conserved principles. *Neuron*, 48, 417-443.
- Buttoud, S., Les affections des glandes salivaires chez les carnivores domestiques, Thèse vétérinaire de l'Université Claude Bernard - Lyon 1 - France, 2002.
- Elliott R., Total distribution of taste buds on the tongue of the kitten at birth, *The Journal of Comparative Neurology*, 1937, 66(2): 361-373.
- Finlay et al., 2014 and 2017, American Kennel Club, <https://www.akc.org/expert-advice/lifestyle/see-what-the-world-looks-like-to-a-dog/>
- Girard N., Nutrition et santé buccodentaire chez le chat. In: *Encyclopédie de la nutrition clinique féline*. Pibot P., Biourge V., Elliott D. editors. Editions Aniwa SAS pour Royal Canin; 2008: 357-383.
- Grandjean, D. & Haymann, F. 2010. *Encyclopédie du Chien* ; Royal canin, Paris, 1003p.
- Hennet P., Nutrition et santé buccodentaire chez le chien. In: *Encyclopédie de la nutrition clinique canine*. Pibot P., Biourge V., Elliott D. editors. Editions Aniwa SAS pour Royal Canin; 2006: 388-397.
- Kavoi, B., Makanya, A., Hassanali J., Carlsson, H.S., Kiama, S. 2010. Comparative functional structure of the olfactory mucosa in the domestic dog and sheep. *Annals of Anatomy*, 192, 329-337.
- Lei W. et al., Functional Analyses of Bitter Taste Receptors in Domestic Cats (*Felis catus*). *PLoS One*, 2015.
- Li et al, 2005 - Patent WO 2005/005480, Monell Chemical Center of Sense.
- Marshall, D. A., Blumer, L., Moulton, D. G. 1981a. Odor detection curves for n-pentanoic acid in dogs and humans. *Chemical Senses*, 4, 53-61.
- Marshall, D. A. and Moulton, D. G. 1981b. Olfactory sensitivity to a-ionone in humans and dogs. *Chemical Senses*, 1, 445-453.
- Moulton, D. 1960; Studies in olfactory acuity, 5, *The comparative olfactory sensitivity of pigmented and albino rats*. *Animal Behaviour*, 8, 129-133.
- Pagano, C., & Rofjidal, T. 2014. La sensorialité de la bouche. *Les Cahiers de l'actif*, 452-453.
- Pibot P et al., *Encyclopédie de la nutrition clinique féline*, ivis.org, 2010.
- Riera C., Role and Mechanism of Transient Receptor Potential (TRP) Channels in Gustatory and Chemesthetic Sensations Associated with Dietary Molecules, PhD Thesis n°4212, 2008, <https://www.thefreedictionary.com/somesthesia>