DO CATS LIKE SOUR TASTE?

BACKGROUND

pH is an important consideration in petfoods, both for its impact on function and flavor. There has been a perception that cats prefer sour taste, although data are lacking to support this notion. Both astringency and sour taste are related to pH, but sourness is more directly correlated with titratable acidity. These sensations are mediated by distinct biological mechanisms.

The purpose of this study is to examine the sensitivity of cats to pH and to determine whether preference may be related to pH (astringency), titratable acidity (sourness) or both. Four-bowl comparisons were initially used to screen for preference among acidic solutions versus water. Two-hour water intake was determined for groups of 20 cats and bowl positions rotated over four trials. Then eight-hour paired comparisons were done using individual cats trained to drink from water bottles. Behavioral observations were made at specified intervals to characterize the ingestive and non-ingestive bowl- or bottle- oriented responses such as sniffing and rubbing.

KEY POINTS

- Cats are sensitive to pH, with a steep shift from avoidance to acceptance between pH 3.5 and pH 4 (Figure 1).
- Some cats discriminate citric acid and water solutions at equal pH (astringency) that differed in titratable acidity (sourness) (Figure 2).
- SAPP was preferred to water solutions at equal pH (astringency) that differed in titratable acidity (sourness) (Figure 3).
- SAPP at pH 4.8 or 5.7 was not discriminated (data not shown).
- Titratable acidity may contribute to preference within an acceptable pH range, but not all cats discriminate on this basis.
- Cats appear to use smell and taste to determine preference (Figure 4).

FIGURE 1. FOR ACIDIC SOLUTIONS, INTAKE REFLECTS pH AND NOT TITRATABLE ACIDITY.

- A) pH measurements of 0.03% acidic solutions dissolved in MilliQ water.
- B) Titratable acidity of 0.03% acidic solutions at the pH determined in A.
- C) 4 bowl water test: 4 days, 2 hours and 20 cats. 0.03% solutions at the pH indicated in A.
- D) 4 bowl water test: 4 days, 2 hours and 20 cats. MilliQ water pH adjusted as indicated on graph with either HCl or NaOH.

FIGURE 2. INDIVIDUAL DIFFERENCES ARE EVIDENT IN DISCRIMINATION OF CITRIC ACID FROM WATER AT THE SAME pH BUT DIFFERENT TITRATABLE ACIDITY.

- A) 2 tube test, 12 cat 2 hours, 2 days. Water vs 0.03% Citric Acid pH 5.7 (adjusted with NaOH), average consumption +/- SD statistics are a non-parametric two sample Wilcoxon Test.
- B) Same test as A, the plotted data are individual cat consumption data. Lizzy’s intake may reflect rubbing not licking. Citric Acid Titratable Acidity = 0.135mL.
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figure 3.
cats prefer sapp to water at either acidic or neutral pH

figure 4.
cats use taste and smell to determine preference

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