# A Revolutionary Quantitative Analysis of the Positive Correlation Between Stool Viscosity and Taste Perception

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**Abstract**

We report a groundbreaking discovery of a positive correlation between stool viscosity and taste perception, herein termed the *Viscotaste Phenomenon*. Through the development of novel metrics such as the Fecal Organoleptic Coefficient (FOC) and the Gustatory Viscosity Index (GVI), we establish a rigorous, though entirely hypothetical, mathematical framework linking rheological stool properties to gustatory sensation. Utilizing a state-of-the-art *Gastro-Taste Synthesizer* and employing the patented *Lick-Spin Method*, our experimental data demonstrate that increased stool viscosity enhances perceived taste quality on a scale previously thought impossible. This revelation promises to revolutionize food science, personal hygiene, and gastroenterological diagnostics by introducing a new interdisciplinary field we term *Fecogustrology*.

## 1 Equation 1: The Fecal Viscosity–Taste Transfer Function

The foundational relationship between stool viscosity, $\eta_s$, measured in *Gutpoise* (Gp), and perceived taste intensity, $T_p$, measured in *Flavor Units* (FU), is modeled by the Fecal Viscosity–Taste Transfer (FVTT) function:

$$T_p = \alpha \cdot \eta_s^{\beta} + \gamma \cdot \ln(\delta + \eta_s) \tag{1}$$

where $\alpha = 42.7$ FU $\cdot$ Gp$^{-\beta}$ represents the taste amplification constant, $\beta = 0.86$ is the non-Newtonian exponent reflecting stool shear-thinning behavior, $\gamma = 13.3$ FU accounts for logarithmic saturation effects, and $\delta = 0.15$ Gp is the minimal viscosity threshold below which taste perception is negligible.

Equation (1) posits that taste intensity grows supra-linearly with viscosity until a saturation plateau induced by logarithmic dampening. This implies that slightly more viscous stool samples are perceived as significantly tastier, a paradoxical phenomenon previously unaccounted for in gastroculinary literature.

## 2 Equation 2: Gustatory Viscosity Index (GVI)

To quantify the combined effect of stool viscosity and its microstructural complexity on taste, we define the Gustatory Viscosity Index (GVI):

$$\text{GVI} = \frac{\eta_s \cdot \phi_c^{1/3}}{1 + e^{-\kappa(pH - pH_0)}} \tag{2}$$

where $\phi_c$ is the colloidal particle concentration (dimensionless), $\kappa = 5.4$ is the pH sensitivity coefficient, $pH_0 = 6.9$ is the neutral stool pH, and $pH$ is the measured acidity. The denominator models the sigmoidal influence of pH on taste-enhancing enzymatic activity within stool, which modulates flavor compound release.

This equation reveals that stool with moderate acidity and high particle concentration exhibits maximal GVI, thereby maximizing taste perception potential. The cube root scaling of $\phi_c$ reflects diminishing returns of particle aggregation on viscosity-mediated taste.

## 3 Equation 3: The Organoleptic Flavor Diffusion Equation

To model the temporal evolution of taste perception after stool sampling, we propose the Organoleptic Flavor Diffusion (OFD) equation:

$$\frac{\partial F}{\partial t} = D\nabla^2 F - \lambda F + S(\eta_s, t) \tag{3}$$

Here, $F = F(\mathbf{x}, t)$ represents the flavor concentration field (in arbitrary Taste Concentration Units, TCU), $D$ is the diffusion coefficient (in cm$^2$/sec), $\lambda$ is the enzymatic flavor degradation rate constant, and $S(\eta_s, t)$ is the viscosity-dependent source term defined as

$$S(\eta_s, t) = S_0 \cdot e^{-\mu t} \cdot \sqrt{\eta_s}$$

with $S_0$ a normalization constant and $\mu = 0.11$ sec$^{-1}$ the viscosity-flavor decay parameter.

Equation (3) captures how flavor molecules emanate from the stool matrix and diffuse through the gustatory epithelium, with viscosity directly modulating the source strength and temporal persistence of flavor signals.

## 4 Experimental Data and Analysis

We conducted an extensive series of *Lick-Spin* trials, in which 42 volunteers sampled synthetic stool analogues with viscosities ranging from 0.1 to 10 Gp. Taste perception was quantified using a forced-choice scaling method calibrated against the FOC scale.

Table 1 presents the aggregated results, showing a clear positive correlation between $\eta_s$ and $T_p$, in accord with Equation (1).

The data reveal that taste perception increases rapidly with viscosity, plateauing near 10 Gp. Additionally, optimal taste occurs at near-neutral pH with elevated colloidal content,

Table 1: Experimental Stool Viscosity vs. Taste Perception Data

| Sample ID | Viscosity $\eta_s$ (Gp) | Colloidal Conc. $\phi_c$ | pH | Measured Taste $T_p$ (FU) |
|---|---|---|---|---|
| A1 | 0.12 | 0.02 | 7.1 | 5.8 |
| A2 | 0.55 | 0.15 | 6.8 | 15.4 |
| A3 | 1.8 | 0.45 | 7.0 | 38.9 |
| A4 | 3.4 | 0.62 | 6.5 | 59.1 |
| A5 | 5.7 | 0.78 | 7.2 | 87.3 |
| A6 | 7.9 | 0.91 | 6.9 | 103.6 |
| A7 | 9.8 | 0.97 | 7.0 | 115.4 |

confirming the predictions of Equation (2). The OFD model (3) successfully fits the temporal decay of taste intensity observed in time-course trials (data not shown for brevity).

These findings suggest that stool viscosity is a critical determinant of organoleptic quality, challenging prior assumptions that fecal matter is intrinsically tasteless and opening avenues for novel *gustofecal* diagnostics and culinary applications.

# 5 Conclusions

Our fictive yet mathematically robust study establishes a positive correlation between stool viscosity and taste perception, quantified by three novel equations. This absurd but rigorously defined correlation invites future research into the fusion of gastroenterology and culinary science, potentially transforming medical diagnostics, flavor engineering, and personal hygiene protocols.

# References


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