

Fractal Breakfast Cereal: A Chaotic Dynamical System Fortified with Eight Essential Vitamins and Minerals

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"topological
refugees"**

Abstract

A summary of the results from an interdisciplinary study is presented, confirming the efficacy of applying fractal geometries to the classic breakfast cereal problems of saturation and packing.

Method

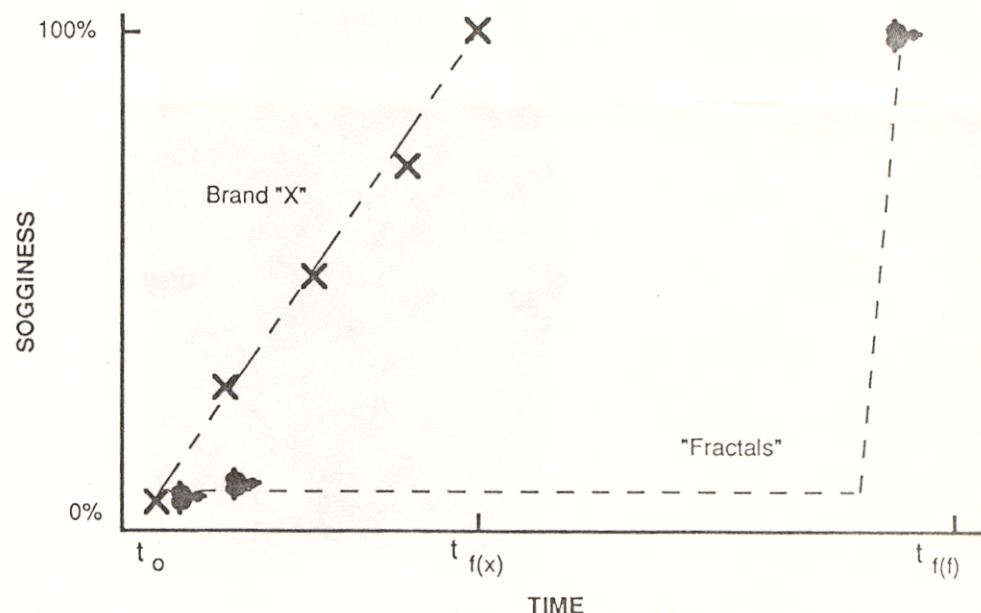
A prototype cereal, "Fractals," was developed and tested for its ability to solve two classic breakfast cereal problems. The first, saturation (sogginess), has received some attention in industry. Rice Crispies®, Crispex®, and Team® are typical of early attempts to delay the onset of sogginess. Part 1 of this report gives results of a comparison of sogginess as

a function of time between a typical cereal and "Fractals." The second problem, more of an engineering/marketing concern, has its roots in packaging theory. Part 2 reports what, if anything, is meant by that.

Part 1: Sogginess

Figure 1 shows a comparison of time to saturation (inedible sogginess) between Brand "X" and "Fractals." The effects of a quasi-infinite surface area are dramatic. The experiment began at t_0 , when 4 times the serving size of each cereal was combined with 6 servings of milk¹. At $t_{f(x)}$, Brand "X" was at an unacceptable sogginess level² and had to be composted. "Fractals" showed little increase

Figure 1 Comparison of a "typical" cereal and "Fractals"



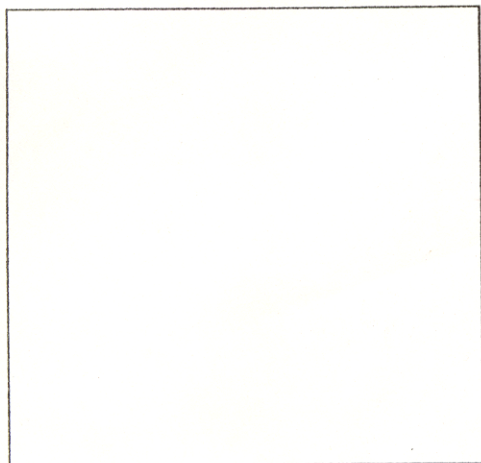


Table top – time 0

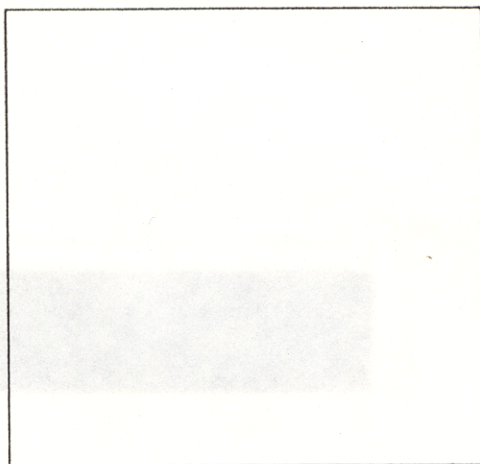


Table top – 3 weeks later

in sogginess well beyond this point. The experiment was stopped at $t_{f(f)}$. "Fractals" were indeed soggy at $t_{f(f)}$, but by this time the milk has turned a complex color, exhibiting the rarely observed second-order Carrell effect.³ The paucity of data points for "Fractals" is regrettable but unavoidable in a study of this type. Having been raised according to the instant-gratification-entertainment paradigm on which the experiment draws, the experimenter grew bored with taking data, turned on the TV, and ceased taking measurements. So $t_{f(f)}$ (and the curve leading to it) is the best-guess⁴ value of when sogginess occurred.

Part 2: Settling

A phrase that commonly appears on cereal boxes is "This package is sold by weight not volume. Some settling may have occurred during shipping and handling." "Fractals," with their nonlinear dynamical roots, need never be packaged in boxes displaying this type of statement. "Fractals" never settle. This does not, however, result in unacceptable numbers of "topological refugees".⁵ This term refers to cereal that is found between the box and the lining. Time lapse photography (see Figure 2) shows that "Fractals" do not migrate through this lining via quantum tunneling or any other anomalous effect.

Conclusions and Directions for Future Research

"Fractals" imply breakfast. "Fractals" sog slowly. "Fractals" turn the milk a complex color. "Fractals" do not settle down. "Fractals" stay where they belong.

Future research should address the following questions:

- How many bowls of "Fractals" does it take to equal one bowl of Total®?
- Can strange attractors be applied to advertising and marketing?
- How many proofs-of-purchase should be required for a free Julia set?

Notes

1. The experimenter has never eaten just one serving/bowl.
2. For the mathematically inclined, the technical term is "gross."
3. Named for the pioneering cereal-fractalogist M. C. Carrell.
4. Again, for the mathematically inclined, the technical term is "fudged."
5. Dr. Science's answer to the question "Occasionally when I open a box of Cheerios I notice a few outsiders (sic) of the bag inside. How did they get there? Are they safe to eat?" in *Orbit* 1 (November 8, 1990), p. 23.

