

THE BASIC CONCEPTS OF GELATERIA "DESTROYED" BY SCIENCE

In this short publication we will examine some concepts of Gelateria which, in the face of scientific considerations, are not at all reliable and, absolutely, to be reviewed.

1. TO OBTAIN A GELATO WITH A CONSISTENT AND CREAMY STRUCTURE, ITS NUTRITIONAL VALUES MUST BE BALANCED

By "balanced nutritional values" we mean that the percentage quantities of Sugars, Fats and Proteins (or Milk solids not fat) present in the Gelato must correspond to pre-established and determined values (or to a range of values).

Unfortunately, there is no scientific expression or formula that links these nutritional properties to the structure of a Gelato.

In truth, an "inverse artifice" is performed in which the percentages of Sugars, Fats and Proteins are obtained from a structurally consistent and creamy Gelato, obtained from innumerable laboratory tests, thus affirming that, with these percentages, it will be possible obtain a consistent and creamy Gelato.

Furthermore, without giving a value to the required requirements (Consistency and Creaminess), without considering the air incorporated by the Gelato during freezing (Overrun) and without evaluating the percentage of Ice present at the tasting temperature.

2. A CONSISTENT AND CREAMY GELATO HAS A FIXED AFC VALUE (ANTI-FREEZE CAPACITY)

AFC represents, chemically, the Sucrose Equivalent, with Sucrose having an AFC=100. For any other Ingredient, with a given Molecular Weight (MW), the formula will apply:

$$AFC_{\text{INGREDIENT}} = (342 \text{ MW}_{\text{SUCROSE}} \times 100) / \text{MW}_{\text{INGREDIENT}}$$

The AFC of a Gelato is, therefore, given by the sum of the single contributions of all the Ingredients present in the Recipe.

We do not spend further words on this "misleading concept" as the AFC, as such, does not take into consideration either the air incorporated by the Gelato during mixing and freezing (Overrun), nor the percentage of Ice present at the temperature considered, distorting all the assumed considerations.

3. THE SWEETNESS OF A GELATO IS GIVEN BY THE SWEETENING POWER (SWP)

The Sweetness value of an Ingredient (Sucrose) is given by a scale of values in which a value of 100 is attributed to Sucrose.

Calculation of the SWP of a Gelato, according to one of the "basic concepts" of the Gelateria, is given by the sum of the individual SWP contributions of the Ingredients that make up the Recipe.

Unfortunately, also in this case, the exposed concept will have to be reviewed as the obtained SWP is a value of Mathematical Sweetness.

The Perceived Sweetness, the sensation of "sweet" felt by whoever is tasting the Gelato, will instead consider the Temperature and Overrun of the Gelato tasted, the quantities of Ice, Total Solids and Organic Acids present, which significantly reduce the perception of "sweet".

4. FATS INCREASE THE CREAMINESS OF A GELATO

A completely unfounded concept. The droplets of Fat dissolved in the Gelato matrix are essentially solid and are mainly found around the air bubbles which form the Overrun. There is nothing "creamy" about it.

On the other hand, if we consider the statement to be true, we will have to review the whole concept itself regarding low-fat Gelato or Fruit Gelato, which while showing a good Creaminess, come with a negligible or no percentage of Fat. Are all Fats equally usable? No, but that's another research.

5. PROTEINS INCREASE THE OVERRUN OF A GELATO

This cliché is difficult to remove but (almost) totally unreliable.

The proof is dictated by the fact that even a protein-free Gelato incorporates air during the stirring and whipping process.

The merit of the Proteins is that they "bind" with the Fats to stabilize the formed air bubbles and that this stabilization leads to the apparent illusion of having produced a greater Overrun in the Gelato.

Does this apply to all Proteins? No, but that's another research.

6. YOU CAN PREDICT THE VISCOSITY OF A GELATO (AT -12°C) FROM THE CALCULATION OF THE VISCOSITY OF ITS MIXTURE AT ROOM TEMPERATURE (+20°C)

This is a scientific falsehood.

Otherwise, huge economic efforts would not be employed for experiments in zero gravity or at pressures higher than our habitat or for inaccessible temperatures.

An algorithm would be enough to bring the evaluation back to the desired and imposed conditions and everything would be resolved.

In this case, the calculation of the Viscosity of a Gelato should consider 2 other parameters, absent in the conditions at room temperature (+20°C) of the Mixture and which cannot be calculated: the Overrun which is created during the mixing and whipping phases and the changeable distribution of Water into Liquid and Ice according to the external Temperature.

Therefore, an unfeasible calculation expectation.

For Consulting, Software and Information: <http://www.articagel.it>

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