



University of Gastronomic Sciences
Università degli Studi
di Scienze Gastronomiche

University of the Gastronomic Sciences

Sensory Analysis Laboratory

and

Pollenzo Food Lab

**SENSORY EVALUATION
OF TORTELLINI FRESH PASTA SUBJECTED
TO CRYOGENIC FREEZING**

Client: **Il Matterello - Tortellinice**

Sensory Analysis Laboratory

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This report refers to the activities conducted by the staff of the Sensory Analysis Laboratory of the University of Gastronomic Sciences (UNISG) on December 14, 2023, on behalf of Il Matterello, in accordance with the proposal for experimental activity by Professor Luisa Torri (UNISG).

1. SCOPE

The purpose of UNISG's activity for Il Matterello was to understand if there is a sensory difference between the Tortellino Gourmet Mutino-Bononiense in the "fresh" and "cryo" versions (subjected to cryogenic freezing for its best preservation).

2. MATERIALS AND METHODS

2.1. Products

Two types of tortellini were analysed (Annex 1), a "fresh" sample and a "cryo" sample: the ingredients used, as well as the processing phases, were identical for the two types, only differing in the way they were preserved. The samples were prepared by the company the day before the sensory evaluations and arrived at the Pollenzo Food Lab, in a refrigerated van, the morning of the sensory test.

The "cryo" samples were subjected to cryogenic freezing at the Pollenzo Food Lab directly on the morning of the test and preserved in a blast chiller until cooking. The "fresh" samples, however, were preserved in the refrigerator until the moment of cooking. The tortellini were cooked just before each sensory session (Annex 2), to maintain the sensory characteristics and to preserve the freshness of the products. All samples were cooked in meat broth supplied by the company. Once cooked, the samples were transported to the Sensory Analysis Laboratory in heat containers suitable for transport (Annex 3), portioned and served immediately to the subjects.

The samples were served to the tasters in containers made of biodegradable material of 90 ml capacity, coded with random three-digit numerical codes (Annex 4). For each sample, 3 tortellini were presented to each subject.

2.2. Subjects

66 subjects were involved in the study (28 males and 38 females; aged between 18 and 60 with an average age of 28), voluntarily recruited among UNISG students and staff.

The participants were mostly Italian (77%) and were divided into three shifts between 11am and 1pm on Thursday 14th December 2023. After signing an informed consent, the subjects participated in the sensory test lasting about 10 minutes (Annex 5).

2.3. Triangle Test

A triangular difference test was conducted (UNI EN ISO 4120) in which two different types of tortellini were compared. In particular, each taster was presented with three samples, two of which were the same and one different (two of "fresh" tortellini and one of "cryo" tortellini or vice versa). They were then asked to identify the sample that was different from the other two. Since the test was a forced choice, each participant was required to provide an answer, even if random. Samples were presented in a randomized order and balanced across subjects. The evaluation procedure involved rinsing the mouth between one sample and the other.

Sensory evaluations were carried out at room temperature ($22 \pm 1^\circ\text{C}$) in individual computer-controlled cabins under white light (Annex 6). The data was acquired with the Fizz Biosystèmes software version 2.51.

2.4. Statistical analysis of data

For the triangle tests, the number of correct answers obtained in each comparison was calculated to check whether there were significant differences. The significance level considered was 5% ($p < 0.05$).

3. RESULTS

3.1. Triangle test

The results of the triangle test are shown in Table 1.

Table 1. Results of the triangular test conducted to compare the two types of tortellini.

Product	Total no. of answers	No. of incorrect answers	No. of correct answers	p-value	Overall difference
Tortellini	66	51	15	0.977	None

The results show that there is not a significantly different sensory perception for "fresh" tortellini and "cryo" tortellini ($p < 0.05$).

4. CONCLUSIONS

The result of the sensory analysis test was that the cryogenic freezing treatment did not affect the overall sensory perception of the tortellini. From a sensory point of view, overall, the "fresh" tortellini samples and "cryo" tortellini samples were not perceived as different.

5. NOTE

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Pollenzo, 18 December 2023

The Laboratory Technician
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6. ANNEXES

Annex 1. Tortellini before cooking.



Annex 2. The cooking of tortellini in meat broth.



Annex 3. Thermal containers used for transport.



Annex 4. Samples presented in the cabin during the sensory test.



Annex 5. Sensory test participants.



Annex 6. Cabin fitted for conducting sensory tests.

