JAP&T
TPA-Timişoara

Available online at http://journal-of-agroalimentary.ro

Journal of Agroalimentary Processes and Technologies 2018, *24* (3), 211-214

Journal of Agroalimentary Processes and Technologies

Benefits of using almond flour to obtaine pastries

Andreea Bianca Căluțoiu[*1], Corina Dana Mișcă [*1]

[1]*Banat`s University of Agricultural Sciences and Veterinary Medicine "King Michael I of Romania" from Timisoara, Faculty of Food Engineering, Calea Aradului 119, Timisoara 300645, Romania..*

Abstract

This paper is the result of our attempt to get an innovative product with flavour and nutritional properties very appreciated by the evaluators and at the same time salubrious and safe for the consumer. Therefore, we obtained the muffins with almond flour stuffed with plum jam. We modified the standard technological scheme to obtain the muffins, replacing some raw materials with other ones, which we considered to be useful in order to increase the value of the finished product. We determined, at the same time, the microbiological parameters indicated by the legislation in force for the subjects of raw materials and for the end product, this being an obligation imposed by the law, to be able to sample the wholesomeness of food products and represents the criteria required to demonstrate an interest in the safety and health of the consumer. All the microbiological evaluations were done in accordance with the legislative standards in force, for each microbiological parameters evaluated: total coliforms, Bacillus cereus, Staphylococcus aureus, fungus.

Keywords: muffin, plum jam, coliforms, *Bacillus cereus, Staphylococcus aureus*, fungi.

1. Introduction

The purpose of this experiment is to highlight the spectrum of microbiological testing of raw materials and the finished product - *Muffins with almond flour and plum jam stuffing*, which we have designed the product to meet all the criteria of an innovative product. Throughout the work we performed experimental microbiological analyses to assess the presence and number of micro-organisms that might influence the physico-chemical properties of the finished product, especially the load of pathogenic microorganisms whose existence might affect the health of the consumer. The interest for an innovative product, oriented us towards changing the raw materials from the standard composition of a muffin and therefore we ended up replacing the cow milk with almond milk and wheat flour with almond flour.

While studying the raw materials mentioned we ended up at the conclusion that we can achieve a unique natural product by introducing of a Romanian traditional product – plum jam without sugar as stuffing, thus bringing added flavour to the preparation and an energetic addition to the consumer [3].

2. Materials and Methods

To obtain the muffins with plum jam we went through the next steps:

1. We preheat the oven at 180°C;
2. I sifted the almond meal, the wheat flour and the baking powder and mixed them with a spatula;
3. In another separate bowl we mixed the eggs, sugar, milk and vanilla essence until the sugar has melted and added the flour mixture into the composition;

Corresponding author: *e-mail:* c9misca@yahoo.com

4. We melted the butter on the bain-marie and added to the composition;
5. We made small balls of plum jam and roll them through flour so they don't sink in the muffin dough;
6. We sat the paper forms on the muffin tray after which and fill them until they were half full with dough added the plum jam balls and then add the rest of the dough;
7. We put the tray in the oven at 180°C, for 15 to 20 min, until the crust starts to form and cracks;
8. We took the tray out of the and let the muffins cooldown;
9. After they are cold, we took them out of the muffin tray and put them in special muffin boxes [4,5].

To obtain the plum jam we need to follow the next steps :

1. The plums need to be washed with water thoroughly;
2. Get the seed out of the plum an cut it;
3. Sat a pan with on the stove on top of which we put a smaller pan with the cut plums;
4. Let the plum sit on bain marie for 12 hours at medium heat and mix in it every 30 min;
5. Once the plums become a homogeneous paste, let it cooldown completely;
6. After it has cooled down put it in a glass jar and put it in the fridge [6].

For obtain safe and heathy products we conducted microbiological tests of raw materials and finished product. In this sense, we have established in the first phase, microbiological parameters for the mixture of flour used – wheat and almond-, total number of germs belonging to the species Bacillus cereus and the number of yeasts and molds and the microbiological charge from the plum jam-total number if germs and fungal load [1,2].

For the end product – the muffins with almond flour, the microbiological parameters which were verified according to the legislation were:

- the total number of coliforms germs
- the total number of Staphylococcus aureus germs
- fungus load

In order to carry out the bacteriological analysis, the specific protocol for the identification of each of the target germs must be respected [1,2]. All microbiological tests were performed in duplicate.

3.Obtained results

For the recognition of the targeted microbial species, standard work methods have been used. The analysis of raw materials has led us to the following results, as follows:

In the case of flour we found the absence of Bacillus cereus species and the presence of about 300 fungi / gram.

Foto 1. The aspect of fungi colonies on the Sabouraud medium at 72 hours of maintaining a constant temperature - the raw material - the mixture of flour - wheat and almonds

In the case of the handmade plum jam used as filling, his sterility for coliforms, yeasts and molds was found. The product was used immediately after it was obtained.

Analyzing this results and comparing them with the microbiological legislative norms, we establish that all the raw materials are very good from a microbiology point of view, ensuring the healthiness of the finished product

Below are the results obtained for almond flour muffins.

In the next images is exemplified the aspect of the growing environment, respectively of the contaminated germs known from the analyzed product, on the specific growing environment.

Therefore, analyzing the evolution of the *colloform germs*, their absence was fond at 24 and 48 hours of maintaining a constant temperature in the analyzed product.

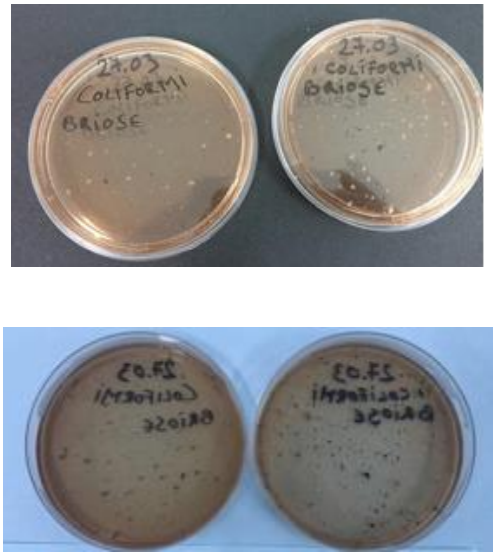

Foto 2. The aspect of the ADCL medium immediately after inseminated and after 24 hours of exposure at 37°C

Regarding the presence of germs belonging to the *Staphylococcus aureus* species, we found the they develop new colonies on the Chapman culture medium.

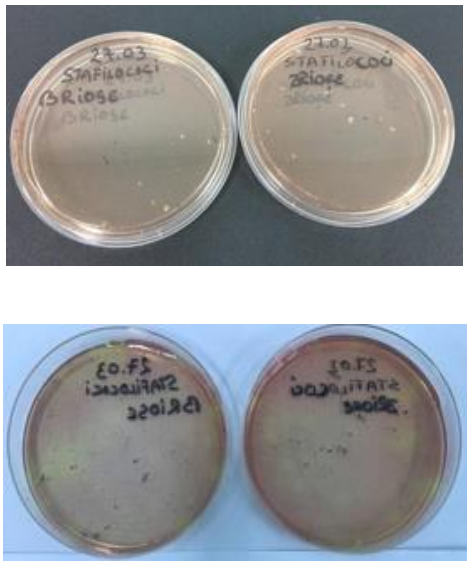

Foto 3. The aspect of the Petri plates, with the Chapman medium, immediately after inseminated and the aspect of the colonies after 24 hours after maintaining at 37°C

Foto 4. The aspect of the Sabordau medium, immediately after inseminated and the aspect of the fungal colonies at 72 hours of maintaining at constant temperature

After 72 hours from inseminated,14 fungus colonies have developed on the Sabouraud environment.

Taking into consideration the legislative rules and comparing the obtained results with the limits of the product standards, it is found that from the microbiological point of view, the obtained products are salubrious, with microbiological parameters below the legal limits in force

4.Conclusions

- The raw materials used are salubrious, the analyzed microbiological parameters falling within the legislative limits;
- Fecal contamination indicators are absent in the obtained products, with the current legislation admitting 10 coliforms / gram in pastry products with fillings;
- Coagulase positive staphylococci were found averages 9 germs / gram in the product, the maximum admissible limit being 10 germs / gram;
- The legal fungal load allowed by law is 100 / gram, while in the almond meal product the number of fungal colonies developed is 14 / gram;

- From the point of view of the organoleptic characteristics, the almond flour muffin was highly appreciated by consumers as: they considered it to have a great taste, elasticity and had a high final shape;
- The raw materials chosen for making the almond flour muffin bring many benefits to the body being natural and containing few additives.

Acknowledgments: PNCDI III 2015-2020 – ID 368 institutional development project:"Ensuring excellence in R&D within USAMVBT" from the institutional performance subprogram 1.2, development of the R&D national system program 1.

Compliance with Ethics Requirements. Authors declare that they respect the journal's ethics requirements. Authors declare that they have no conflict of interest and all procedures involving human / or animal subjects (if exist) respect the specific regulation and standards.

References

1. Mişcă Corina Dana, *Microbiologia produselor agroalimentare*, Ed. Solness, Timişoara, **2001**, 217-220
2. Mişcă Corina Dana, *Îndrumător pentru lucrări practice – Microbiologie agroalimentar*ă, Ed. Solness, Timişoara, **2001**
3. Radu Florina Adriana, *Tehnologia laptelui şi a produselor lactate*, Ed. MIRTON Timişoara, **2006**, 203-205
4. https://hubpages.com/food/History-of-Baking-Muffins
5. https://www.scribd.com/doc/266015432/Industria-Panificației
6. http://www.csid.ro/diet-sport/dieta-si-nutritie/prunele-miracole-pentru-sanatate-afla-de-ce-e-bine-sa-le-consumi