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EVALUATION OF THE FERMENTATIVE POTENTIAL OF SOME BAKERY YEASTS

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Abstract
The intensity of the transformation of carbohydrates in the dough during the fermentation is a very close relationship with commercial form of the Sacharomyces cerevisiae bakery yeast used in the technological processes of obtaining the bakery products. In this framework is placed also this paper in which we proposed the studying of two types of yeasts from the point of view of the capacity of fermentation, of transformation of the main components of wheat flour by direct evaluations of the quantity of carbon dioxide emitted.

Key words: fermentation, bakery yeast, carbon dioxide

INTRODUCTION

The most used microorganisms in the food industry of today and not only, are the yeasts. Referring strictly to the bakery part, their introduction in the dough is made for the purpose to ferment the dough to obtain products with large volume a certain degree of porosity. In order to reach this purpose, there were many researches made during many years by many researchers for the purpose of selection of many yeast species and stalks with a high potential of transformation of carbohydrates, with emission of carbon dioxide and which can be adapted to the conditions existent in the dough medium.

The most frequently used yeast today in the bakery belongs to the Saccharomyces cervisiae species, a yeast of higher fermentation, of the *Saccharomyces* type*, Saccharomycetaceae* family*, Endomycetales* order*, Ascomycotina* subdivision.

This type of yeast is traded under many forms: compressed yeast (fresh), dry active yeast, protected dry yeast and yeast dried instantly. When it is chosen a certain type of commercial yeast depending on the category of user will be considered the following: if we speak about the final consumer then the first place for him is the cost of the yeast and if we talk about a producer, he will be interested of the quality of the yeast, of the decrease of production costs, of the possibility to control and automatize the technological fluxes of production.

The technological quality of the bakery yeast is dependent on the speed of its adapting to the conditions from the dough (the content of sugar, temperature, pH, content of oxygen, the activity of water etc.) that has to be clearly established to that it would produce a greater quantity of gases and moreover an uniform fermentation that can be assured during the fermentation of the dough.

This study is going in this direction, following the capacity of fermentation of two types of yeast in compressed and active dry condition, the Saccharomyces cerevisiae species, commercialized in the commercial networks from different producers. We followed the way in which this yeast, with different origins ferment the sugar from the dough.

MATERIAL AND METHOD

In order to reach the proposed purpose, was battered the dough with each of the 4 types of yeast. The dough made with both sorts/types of yeast had the same quantities of raw and auxiliary materials as the following: 12,5g yeast, 250g wheat flour, 130ml water, 0,25g salt; and the one with dry yeast: 3,5 g yeast, 250 g wheat flour, 130 ml water, 0,25 g salt. The dough after the battering was introduced in graded cylinders of 1000 cm^3.

The evolution of the carbon dioxide emissions was made by measuring in different intervals of time the increasing volume of the dough. The beginning moment of the monitoring represents the minute 0, namely the moment when it was introduced each version in the cylinder. In order to establish the capacity of the wheat flour to form and store were made repeated measurements by measuring the volume of the dough.

RESULTS AND DISCUSSIONS

In order to obtain qualitative bread there has to be a great quantity of carbon dioxide during the entire technologic process. The dough needs to have good reologic characteristics that would allow it to have a better stockage and to keep the gases from the dough. The dough obtained with a dry yeast registers a constant increase in volume during the entire period of fermentation; in the first half an hour it was emitted a large quantity of CO_2, but, once the time was passing the quantity of CO_2 has increased.

In the monitored period, the dry yeast version V2 registers lower emissions of CO_2, being maintained constant during the entire period of monitoring compared to V1 that began with a smaller volume than V2, but, along the way, in figure 1 it can be observed that the emissions of CO_2 were greater in the first minutes of the monitoring being followed then by a constant evolution.

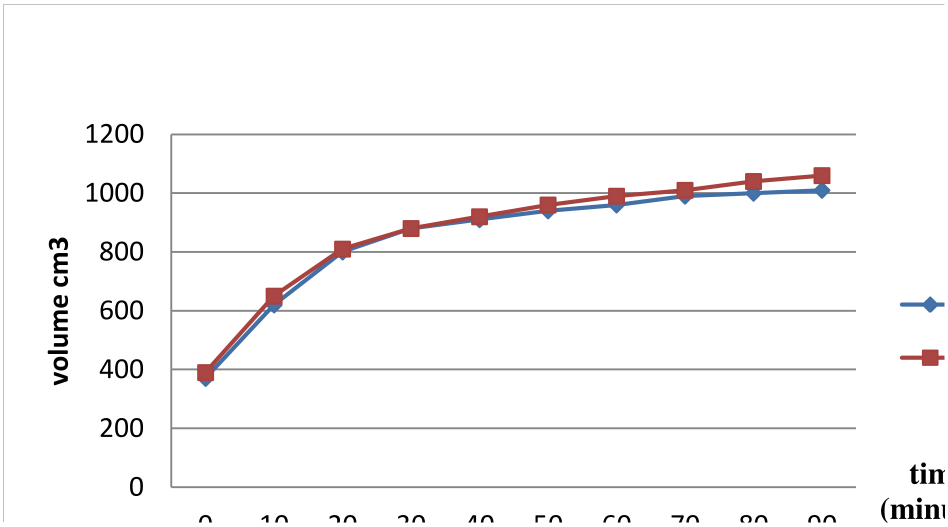

Figure 1. The evolution of the quantity of CO2 in the dry yeast

The compressed yeast presents the most intensive fermentative activity of all the analyzed samples. The volume of the samples of dough with compressed yeast is developed suddenly in the first 20 minutes of fermentation, after which the development is non significant. The quantities of carbon dioxide emitted have registered the largest values for the compressed yeast versions V2.

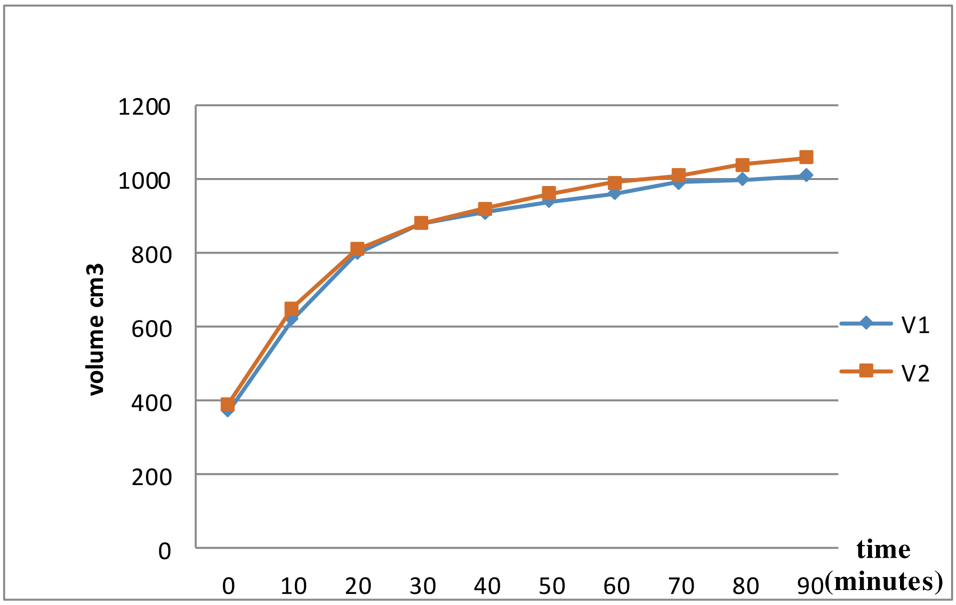

Figure 2. Evolution of the quantity of CO2 in the compressed yeast

The emissions of carbon dioxide are larger only in the first part of the process of fermentation in case of the flours with small capacity of formation of gases and the obtained products are not qualitative, while in the flours of superior quality the formation of gases is made on the entire period of the fermentation process.

CONCLUSIONS

The quantity of carbon dioxide formed during the period of fermentation was influenced significantly by the salt in which is the used yeast and also by the source (its producer). After the fermentation of the dough obtained with different commercial forms of yeast for 90 minutes we can conclude that, compared to the dry yeast, the compressed yeast presents a higher degree of fermentative activity, emitting thus the greatest quantity of CO_2.

REFERENCES

1. Anghel I. 1989. *Biologia şi tehnologia drojdiilor vol I*, Editura TEHNICĂ, Bucureşti;
2. Anghel I. 1991. *Biologia şi tehnologia drojdiilor vol II*, Editura TEHNICĂ, Bucureşti;
3. Anghel I. 1993. *Biologia şi tehnologia drojdiilor vol II,* Editura TEHNICĂ, Bucureşti;
4. Constantin Banu. 2000. *Biotehnologii în industria alimentarã ,* Editura TEHNICA Bucuresti;
5. Despina Bordei. 2004. *Tehnologia modernã a panificatiei,* Editura AGIR, Bucuresti;
6. Despina Bordei. 1987. *Biotehnologii în industria alimentarã*, Editura TEHNICA Bucuresti;
7. Despina Bordei. 2000. Stiinta si tehnologia panificatiei, Editura AGIR, Bucuresti;
8. Jianu I. 1993. *Tehnologii generale în industria alimentara*, vol. I, Editura Euroart, Timisoara;
9. Mihai Leonte, 2003. *Tehnologii, utilaje ,retete si controlul calitãtii în industria de panificatie, patiserie, cofetãrie, biscuiti si paste fãinoase. Materii prime si auxiliare*, Editura MILENIUM , Piatra Neamt;
10. Moldoveanu Gh. 1992. *Tehnologia panificaţiei*, Editura TEHNICĂ, Bucureşti.
11. Moldoveanu Gh. 1994. *Procedee moderne folosite la controlul proceselor tehnologice în industria morăritului*. Editura Tehnică, Bucureşti;
12. Tucu D. 1994. *Panificatia, sisteme tehnice si structura produselor de panificatie.* Editura Tehnica, Bucuresti;