

SENSORIAL EVALUATION OF BRAZILLIAN HONEY

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ABSTRACT

Gamma radiation was found to decrease the number of bacteria and fungus. However when any food is submitted to irradiation the process must comply with legislation that states the minimum dose has to attend the objective of the irradiation and the maximum one must not impair the quality of the food. To control the effects due to maximum dose sensorial evaluation is a common practice. Little information is available for irradiated honeys in literature. The objective of this paper was to evaluate the sensorial profile of irradiated honey called "Organico" at the doses 5kGy and 10kGy. The sensory evaluation was carried out for the parameters Color, Odor, Taste and Consistency, using a nine point hedonic scale. All the data were treated with a statistical tool (Statistica 5.1, StatSoft, 1998). The Organico honey presented the taste parameter for 10kGy significantly lower than the control mean but it did not differ significantly from the 5kGy value ($p < 0.05$). The histograms related to the four parameters are showed.

1. INTRODUCTION

Brazilian legislation approved food irradiation process since 1973 and current review (january/2001) states minimum dose as that attend the purpose by which food is irradiated, and maximum dose as that respect the quality, functional and sensorial characteristics of the food. Essentially maximum dose frequently requires sensorial evaluation of the product to be irradiated.

Food is submitted to gamma irradiation process for different purposes, among them microorganisms load reduction. Honey is a product that is free of most microbes and those microbes that may be present are likely to be in very low numbers. The use of honey in products that receive no or limited heat treatment may require additional tests besides total plate count [1]. In commercial point of view, microbiological contamination of bee products has become interesting on legislation aspects [2]. The gamma irradiation process seems to be a good alternative instead pasteurisation to avoid heating. Gamma radiation applied on seven honey samples was found to decrease the amount of aerobic and anaerobic bacteria and fungi [3].

Honey is nectar, constituted essentially of sugar syrup. The main sugars in honey are monosaccharides – fructose and glucose – which sum 70%. Dissacharides, including saccharose, are around 10% and water where sugars are dissolved is approximately 20% [4]. The exact composition of honeys depend on the region, mainly the botanicals, from which they derive [5]. Honey is used in condiments, salad dressing, barbecue sauce and peanut butter. Dairy meat, beverage, snack and candy manufacturers also use honey as an ingredient.

The present paper had the objective to study the sensorial evaluation of honeys irradiated at 5kGy and 10kGy and compared with control.

2. EXPERIMENTAL

2.1. Materials

Conventional honey type Organico was from São Paulo region, kindly supplied by MN PRÓPOLIS enterprise. The samples were irradiated in flasks containing 1kg each. The composition of a typical batch was:

Water content: 18.5%

Saccharose content: 0.96%

Reduced sugars: 70.62%

HMF content: 2.7mg/Kg

2.2. Irradiation

Irradiation were performed in a ⁶⁰Co Gammacell 220 (AECL), at a mean dose rate of 5,53 kGy/h and dose uniformity factor of 1.13, with doses of 0kGy, 5kGy and 10kGy.

Dosimetry was done using Amber routine dosimeter (Harwell, United Kingdom) and dose rate was established using Fricke reference dosimeter to plot calibration curves. The whole dosimetry system is in IDAS program from International Atomic Energy Agency.

2.3. Sensorial evaluation

The sensorial evaluation was performed by untrained panellists (n=34, being students and employees of CTR-IPEN, São Paulo, Brazil), using a nine point hedonic scale ranging from 1 (most disliked) to 9 (most liked) for the parameters Color, Odor, Taste and Consistency [6, 7, e 8].

3. RESULTS AND DISCUSSION

Table 1 presents the scores obtained from the panellists for the parameters colour, odour, taste and consistency.

The Organico honey presented the taste parameter for 10kGy significantly lower than the control mean but it did not differ significantly from the 5kGy value (Table 1). The Colour parameter presented no significantly differences among irradiation. Odour and Consistency did not showed any significantly difference ($p < 0.05$).

The mean values on the hedonic scale ranged 6,53 to 7,85 for Organico honey. These results indicate acceptability from average to up. The results got in other work evolving irradiated honeys showed the same trend, where the colour, taste and smell of this sensorial evaluation performed in three honey samples that were irradiated at 10kGy remained unchanged when compared to unirradiated pairs [3].

Table 1. – Scores obtained from panellists (means and standard deviation) of the parameters for the sensorial evaluation of honey type Organico.

| | Color | Odor | Taste | Consistency |
|-------------|-----------------|-----------------|------------------|-----------------|
| Control | 7,24 ± 1,72 (a) | 7,09 ± 1,58 (a) | 7,53 ± 1,66 (a) | 7,85 ± 1,28 (a) |
| Dose 5 kGy | 7,38 ± 1,63 (a) | 7,18 ± 1,49 (a) | 7,18 ± 1,59 (ab) | 7,44 ± 1,67 (a) |
| Dose 10 kGy | 7,47 ± 1,35 (a) | 6,79 ± 1,51 (a) | 6,53 ± 2,21 (b) | 7,59 ± 1,62 (a) |

Means in each column with different letters are significantly different ($p < 0.05$).

The answers from panellists were presented in histograms format for the four parameters studied (Figures 1, 2, 3 and 4).

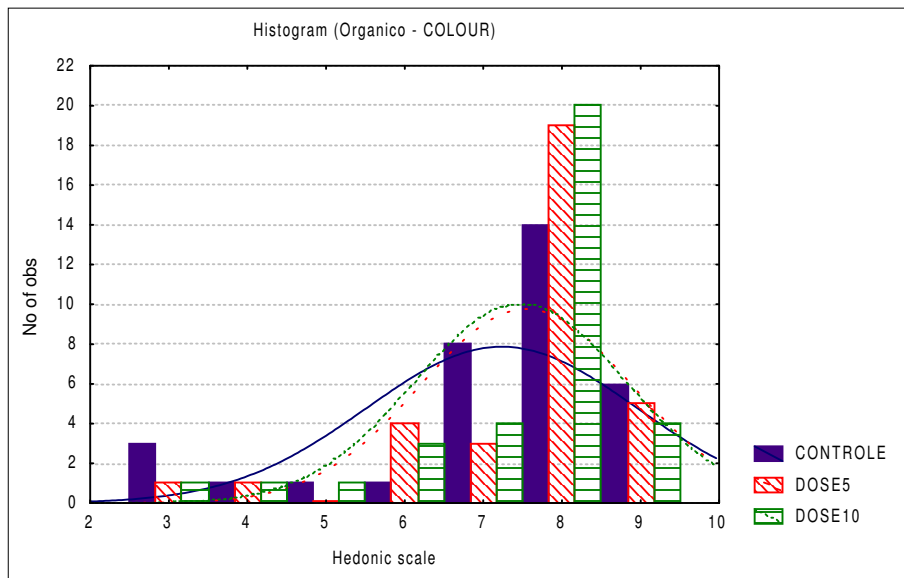


Figure 1. Histogram of panellists answers for colour parameter.

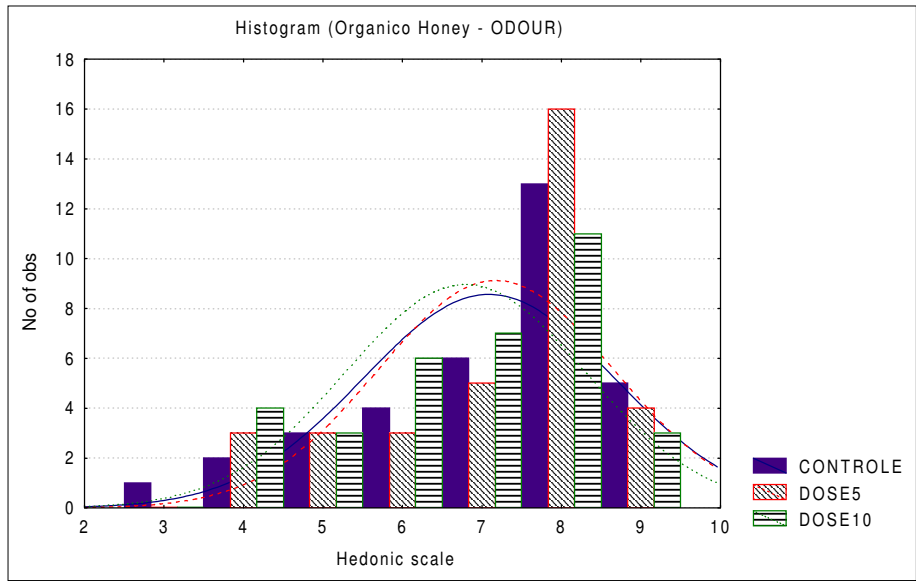


Figure 2. Histogram of panellists answers for odour parameter.

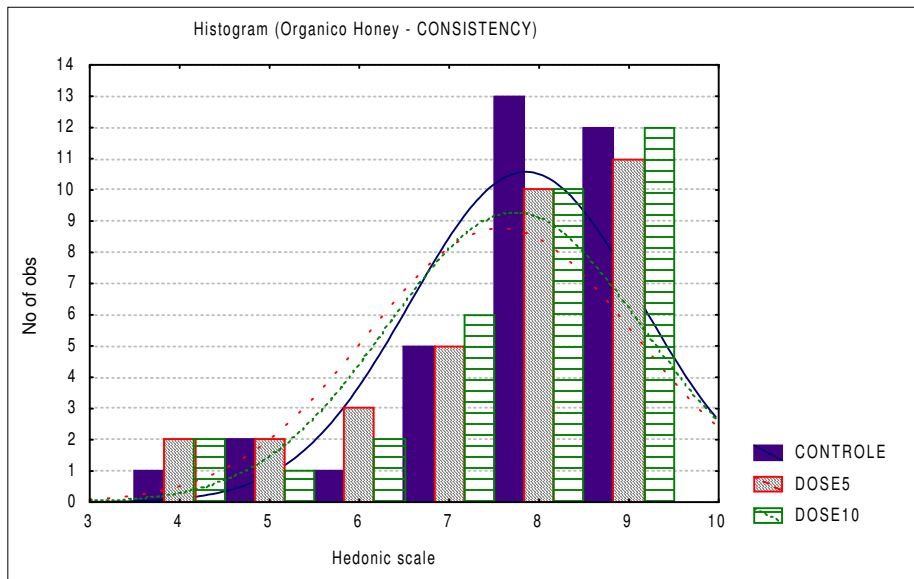


Figure 3. Histogram of panellists answers for consistency parameter.

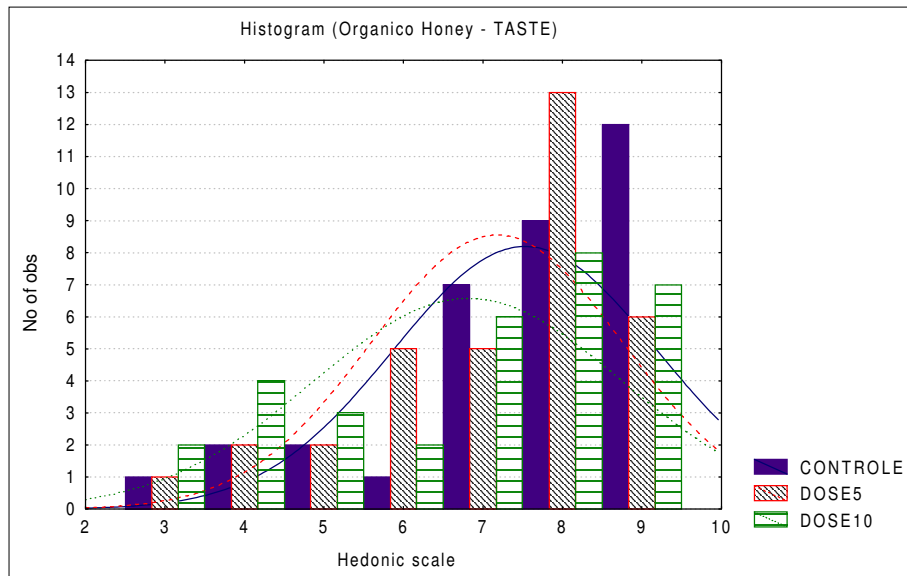


Figure 4. Histogram of panellists answers for taste parameter.

4. CONCLUSIONS

In general, the acceptability of sensorial characteristics was favourable for irradiated honeys. The taste was significantly affected ($p < 0.05$) for Organico sample being the higher mean was for control. The latter was not significantly different from 5kGy but differed significantly from 10kGy and 10kGy did not differ significantly from 5kGy.

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