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Canine vegan biscuits with prebiotics

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Abstract

There are a growing number of consumers, supporters of veganism that include this lifestyle in their pets. In this context, the aim of this study was to prepare four different formulations of vegan canine biscuit by replacing wheat flour with inulin at the following concentrations: 0% (F1, control), 3% (F2), 6% (F3) and 9% (F4). Hydrolyzed soy protein concentrate (3,5%) and liophilized blackberry (5%) were also added to F2, F3 and F4. Differences were observed for color, hardness and specific volume between the biscuits. Sensory and palatability tests results showed higher acceptance of F3 and F4 formulations. Therefore, dogs will have a possible nutritional gain by preferring biscuits with inulin, hydrolyzed soy protein concentrate and blackberry.

Key words: Pet food, veganism, canine snack.

Introduction

Brazil has the second largest population of pets, only behind the United States. Among the different sectors of pet industry and market, canine products that are related to the owners' lifestyle provide them an even closer relationship. This study aimed to develop a vegan canine biscuit with inulin, hydrolyzed soy protein concentrate and blackberry.

Results and Discussion

Wheat flour (WF) proximate composition was: 11.82% $\pm$ 0.43 of moisture, 1.39% $\pm$ 1.23 of ash; 1.05% $\pm$ 2.26 of ether extract; 9.76% $\pm$ 0.12 of proteins; total dietary fiber of 2.35% $\pm$ 0.29 and other carbohydrates by difference: 73.31%. These results are in accordance with Brazilian legislation (BRAZIL, 1996) for wheat flour quality.

The images of vegan canine biscuits and their technological properties are shown in Figure 1 and Table 1.

Figure 1. Scanned images of the canine vegan biscuits F1 (control), F2, F3 and F4, each line being a formulation, analyzed during storage days 0, 5, 10, 15, 20, 25 and 30.

F1: formulation control, without inulin, hydrolyzed soy protein concentrate and blackberry. F2, F3 and F4: added with 3%, 6% and 9% of inulin respectively, with hydrolyzed soy protein concentrate and blackberry.

Table 1. Technological characteristics of vegan canine biscuits: F1 (control), F2, F3 and F4¹.

Technological Characteristics	F1	F2	F3	F4
Color:				
L	62.70 $\pm$ 0.74 ^a	33.92 $\pm$ 1.16 ^b	34.01 $\pm$ 0.21 ^b	33.52 $\pm$ 0.33 ^b
a*	7.41 $\pm$ 0.51 ^b	12.21 $\pm$ 0.17 ^a	12.55 $\pm$ 0.22 ^a	12.85 $\pm$ 0.09 ^a
b*	28.85 $\pm$ 1.12 ^a	16.37 $\pm$ 0.22 ^b	17.24 $\pm$ 0.74 ^b	14.97 $\pm$ 0.85 ^b
Hardness (N)	28.69 $\pm$ 2.94 ^a	23.93 $\pm$ 2.36 ^b	20.04 $\pm$ 2.50 ^c	20.71 $\pm$ 2.88 ^c
Specific Volume (cm ³ /g)	3.28 $\pm$ 1.09 ^{n.s.}	2.06 $\pm$ 0.88 ^{n.s.}	2.72 $\pm$ 0.91 ^{n.s.}	2.41 $\pm$ 1.03 ^{n.s.}
Weight loss (%)	36.99 $\pm$ 4.49 ^{n.s.}	35.41 $\pm$ 3.50 ^{n.s.}	33.26 $\pm$ 5.92 ^{n.s.}	36.05 $\pm$ 3.74 ^{n.s.}
TD before and after oven (cm) ²	0.17 $\pm$ 0.03 ^b	0.19 $\pm$ 0.03 ^b	0.24 $\pm$ 0.05 ^a	0.16 $\pm$ 0.04 ^b
Horizontal GD (mm) ³	0.24 $\pm$ 0.14 ^b	0.34 $\pm$ 0.04 ^a	0.20 $\pm$ 0.11 ^b	0.24 $\pm$ 0.09 ^b

¹F1: formulation control, 0% inulin; F2: 3% inulin; F3: 6% inulin and F4: 9% inulin. Results expressed as mean $\pm$ standard deviation. Different letters on the line differ from one another by the Scott-Knott test (p < 0.05); n.s.: non-significant; ²TD: Difference of thicknesses before and after oven. ³GD: Horizontal growth of biscuits.

The biscuits F2, F3 and F4 showed activity of the bioactive pigments and polyphenols of blackberries and presented browning from the Maillard and caramelization reactions of inulin and hydrolyzed soy protein concentrate during baking time visible by the color changes observed in Figure 1. Despite the differences between biscuits formulations, it was possible to package and store at a single standard procedure all the samples.

The results of sensory and palatability *versus* test formulations (Figure 2) indicate that around 70% of the dogs ingested all the F4 biscuit, in addition, dogs preferred to intake larger amounts of F3 and F4 biscuits than biscuit F1 (control).

Figure 2. Intake (%) of canine vegan biscuit: F1 (control) and F4 formulations in acceptability and palatability tests.

Conclusion

The production of canine vegan biscuits was possible due to slight technological changes caused by the addition of the functional ingredients that did not affect their manufacture. The biscuits used in sensory analysis, F3 and F4, obtained satisfactory results when compared to the control (F1). Therefore, dogs will have a possible nutritional gain by preferring the formulations with inulin, hydrolyzed soy protein concentrate Immunoprotein® and blackberry.

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¹BRAZIL, n°354 of July 18, 1996. Agência Nacional de Vigilância Sanitária, Brasília, July 22, 1996. Section 1.

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