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Production and evaluation of technological characteristics of Fettuccine dried pasta containing bamboo fiber.

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Abstract

Pasta is very appreciated but due to its abundance of digestible carbohydrates, alternatives can be used to make them healthier such as the use of dietary fiber. The aim of this work was to produce and evaluate dried Fettuccine pasta, with partial replacement of semolina by white and pale yellow dietary fibers. The experiments were carried out by a physicochemical and rheological characterization of semolina and the production of dried pasta with partial replacement of fiber in 0%, 3.5% and 7%. The samples were evaluated by their technological qualities in comparison with a standard sample made only with semolina. Statistica were made through analysis of variance (ANOVA) and Scott-Knott test ($p \leq 0.05$). The results showed that is possible to replace the semolina in pasta for the white fibers in the analysed conditions.

Key words:

Healthy, Quality, Wheat.

Introduction

Brazil has high consumption of pasta, but, due to its glycemic index, fiber addition could make them healthier. Since pasta color is an important parameter, the aim of this work was to evaluate pasta production and characteristics with replacement of fibers.

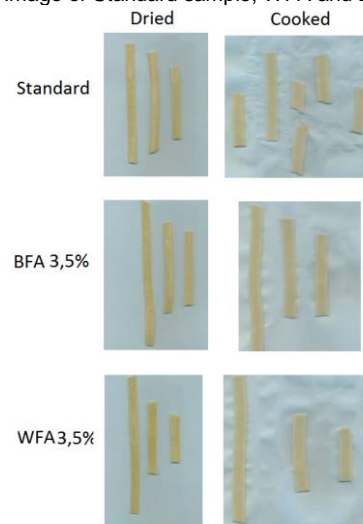
Results and Discussion

Table 1 shows the results of pasta technological analysis. In Image 1 is possible to see images of crude and cooked pastas that presented the best technological results.

Table 1. Cooking characteristics of pasta samples*

Sample	Optimal Cooking Time - OCT (min)	Mass Gain - MG	Volume Increase - VI	Loss of solids (g/100g)	Firmness (F)	Color Cooked Pasta			ΔE
						L	a*	b*	
CFA1	12,5	2,96±0,36 ^{ns}	7,25±0,34 ^{ns}	8,81±0,60 ^b	666,67±64,3 ^b	76,56±0,68 ^c	-1,98±0,15 ^b	25,92±1,71 ^b	8,08
CFB1	12,5	2,96±0,01 ^{ns}	3,5±0,36 ^{ns}	5,47±0,08 ^c	762,6±42,59 ^a	75,14±0,50 ^c	-0,97±0,12 ^a	22,61±0,19 ^c	5,66
CFA2	13	2,35±0,05 ^{ns}	4,29±0,33 ^{ns}	6,07±0,53 ^c	654,86±24,78 ^b	78,65±0,99 ^a	-2,54±0,21 ^c	23,69±1,28 ^c	6,21
CFB2	13	2,91±0,01 ^{ns}	3,86±0,37 ^{ns}	11,80±2,22 ^a	676,72±37,9 ^b	76,15±2,05 ^c	-1,10±0,11 ^a	24,32±0,96 ^c	6,91
BFA1	13	2,62±0,31 ^{ns}	3,43±0,42 ^{ns}	6,70±0,09 ^c	567,32±41,45 ^d	77,90±0,64 ^b	-3,24±0,16 ^d	27,77±0,39 ^a	9,77
BFB1	13	2,82±0,29 ^{ns}	3,57±0,40 ^{ns}	7,65±0,64 ^b	568,86±35,54 ^d	80,13±0,44 ^a	-3,37±0,12 ^d	23,28±1,01 ^c	6,40
BFA2	12,5	3,54±0,44 ^{ns}	3,71±0,38 ^{ns}	8,32±1,58 ^b	597,15±38,48 ^d	79,64±0,59 ^a	-3,50±0,03 ^d	24,91±1,43 ^c	7,52
BFB2	13	2,85±0,09 ^{ns}	4,33±0,38 ^{ns}	7,14±0,17 ^b	629,02±42,78 ^c	79,89±1,13 ^a	-3,55±0,01 ^d	24,45±1,92 ^b	7,23
WFA1	12,5	2,69±0,15 ^{ns}	3,57±0,40 ^{ns}	7,35±1,23 ^b	664,66±52,51 ^b	79,11±0,19 ^a	-3,71±0,02 ^d	24,11±1,29 ^c	6,56
WFB1	14	2,21±0,01 ^{ns}	3,14±0,45 ^{ns}	6,68±0,40 ^c	645,96±39,03 ^c	79,45±0,28 ^a	-3,42±0,06 ^d	24,87±1,56 ^b	7,41
WFA2	12	3,03±0,37 ^{ns}	4,67±0,35 ^{ns}	5,80±0,48 ^c	545,44±32,05 ^c	81,04±0,44 ^a	-3,39±0,06 ^d	22,75±1,18 ^c	6,60
WFB2	12,5	2,89±0,07 ^{ns}	3,38±0,37 ^{ns}	6,52±0,52 ^c	625,76±37,86 ^c	79,97±0,21 ^a	-2,86±0,26 ^c	22,50±0,44 ^c	5,80
BBPA	13	2,82±0,26 ^{ns}	4,17±0,40 ^{ns}	5,65±0,19 ^c	603,32±57,22 ^d	77,88±0,51 ^b	-3,09±0,03 ^b	24,96±1,10 ^b	7,05
BBPB	13	2,79±0,14 ^{ns}	5,2±0,38 ^{ns}	7,88±0,88 ^b	673,67±44,11 ^b	77,20±0,10 ^b	-2,74±0,05 ^c	25,67±0,72 ^b	7,69
Standard	11,5	3,13±0,20 ^{ns}	3,38±0,37 ^{ns}	6,33±0,48 ^c	512,64±37,3 ^c	76,36±0,36 ^c	-4,28±0,13 ^d	18,18±1,18 ^d	0,00

Image 1. Image of Standard sample, WFA and BFA*



*Data expressed as mean \pm standard deviation. Different letters in the same column indicate statistical difference (Scott-Knott test, $p \leq 0,05$), ns=not significant. Where: CFA1 and CFB1: 80% psyllium: 20% cellulose fiber; CFA2 and CFB2: 50% psyllium: 50% cellulose fiber; BFA1 and BFB1: bamboo fiber 60 μ m; BFA2 and BFB2: bamboo fiber 145 μ m; WFA1 and WFB1: wheat fiber 60 μ m; WFA2 and WFB2: wheat fiber 145 μ m; BBPA and BBPB: 20% psyllium: 80% bamboo fiber. Letter A or B at the end of the sample indicates the respective concentrations: 3.5%, 7.0%.

Pasta with replacement of BFB and WFB presented white spots after drying. Samples with BFA and WFA in 3.5% of replacement were similar with the standard.

Conclusions

The results showed that was possible to use white and pale yellow fibers until 3,5% of replacement. Thus, BFA and WFA presented similarity with standard sample.

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