CHICKEN BURGER ENRICHED WITH VEGETABLES

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Background

The market of full and industrialized chicken in Brazil has been growing over the last few months (BERAQUET, 2000). In the research realized with Polish students, 50% of them preferred chicken meat (ZIELINSKA, 1999). ACNIELSEN INSTITUTE (2001) showed that 50,2% of people have been consuming burgers, 26,1% battered chicken like Nuggets and 6,5% preferred mince balls meat. According to a research undertaken with some random foods that are consumed by people from Kuwait , which was then analyzed that the content of insoluble, soluble and the total fibers, they found that people needed to eat daily 20 to 35 grams of total fibers (SAWAYA et al. 1997). The vegetables that have been used with industrialized meat, has increased the percentage of mineral salt, vitamin, glicids, lipids and soluble fibers. These are rich in soluble fibers, with increase the gel needed in the intestine (WEISBURGER, 2000).

Objectives

In this research, was developed one chicken burger enriched with vegetables, the objective is to introduce gradually to the human diet one healthy food, with acceptable sensory properties , adding fibers and decreasing the calorie values .

Methods

To make up this chicken burger adding 10%, 20% and 30% of vegetables, was used scrap of chicken breast, chicken thigh, skin and MSM (mechanical separated meat), TPS (textured protein of soybean) , carrots, broccoli, peppers, haricot beans, stabilization and antioxidant. In this chicken burgers enriched with vegetables were made physico-chemical determination (LANARA,1981), microbiological determination (VANDERZANT and SPLITTSTOESSER 1992), sensory analysis (MONTEIRO, 1984; MORAES, 1993; DUTCOSKY, 1996) and (ANOVA e Tukey) statistics analysis in program MSTATC (MSI, 1989).

Results and Discussion

At the descriptive statistics analysis, in Table 1, grade 7,0 and coefficient of variation of 11,35 to the standard chicken burger and grade 8,3 the coefficient of variation of 10,41 to the chicken burger enriched with 20% of vegetables.

Table 1 - Results descriptive analysis of standard burger and enriched with vegetables.

Test	Chicken Burger	Mean	Coefficient of variation	Confidence of level 95%
	Standard	7,0	11,35	6,62 ↔ 7,37
1	10% vegetables	6,4	7,85	6,16 ↔ 6,63
	20% vegetables	8,3	10,41	7,89 ↔ 8,70
	30% vegetables	6,0	11,34	5,72 ↔ 6,37
	Standard	6,9	18,15	6,31 ↔ 7,48
2	10% vegetables	6,6	17,99	6,04 ↔ 7,15
	20% vegetables	8,4	8,03	8,03 ↔ 8,66

The resulted of the test comparison of Tukey mean sensory analysis presented significance difference at the level of 1% by chicken burger with 20% of vegetables when compared with the others. The test was realized twice (board 1 and 2).

Board 1 - Variance analysis (ANOVA) of first sensory test

Treatment	Mean
3 (20%veg.)	8.3000 a
1 (padrão)	7.0000 b
2 (10%veg.)	6.4000 c
4 (30%veg.)	6.0500 c

Significance difference at the level of 1%. DMS(TUKEY) = 0.5975

Board 2 - Variance analysis (ANOVA) of second sensory test

Treatment	Mean
3 (20%veg.)	8.4000 a
1 (padrão)	6.9000 b
2 (10%veg.)	6.6000 b

Significance difference at the level of 1%. DMS(TUKEY) = 0.7448

The preference sensory was the one using 20% of vegetables formulation, excluding the others with 10% and 30% of vegetables, in Table 2. Where about the percentage from lipids, protein and fibers at the physico-chemical determination there was a significance difference at the level of 1% when used the variance analysis statistic (ANOVA).

Table 2 - Physico-chemical determination of the standard burger and with 20% of the vegetable analyzed and compared with the Federal regulations.

Composition	Federal regulations*	Standard chicken burger	Chicken Burger with 20% of vegetables
Protein (g / 100g)	15,00	15,00 **b**	15,66 **a**
Humidity (g / 100g)	57,00	56,44 **a**	56,26 **a**
Lipíds (g / 100g)	23,00	15,88 **b**	12,08 **a**
Ash (g / 100g)	-	3,00 **a**	2,98 **a**
Fibers (g / 100g)	-	0,0 **b**	4,95 **a**
Caloric value (kcal/ 100g)	-	205,48	174,16

significance difference at the level of 1%
* Legislation value (www.agricultura.gov.br/sda/regulamento tecnico)

According to the microbiology analysis, in Table 3, standard chicken burger and enriched with 20% of vegetable were satisfactory acceptable by Federal regulations.

Table 3 - Microbiological determination of the chicken burger analyzed compared with Federal regulations.

Determination	Federal regulations *	Standard Chicken Burger	chicken Burger with 20% of vegetables
molds and yeasts (CFU / g)	-	1×10^2	1×10^2
Clostridium sulfite reduction 46°C (CFU / g)	5×10^2	$< 1 \times 10^1$	$< 1 \times 10^1$
Staphylococcus coagulase positive (CFU / g)	10^3	3×10^1	4×10^1
Mesofilic aerobics bacteria counting (CFU / g)	-	$2,2 \times 10^3$	$2,7 \times 10^3$
Fecal coliforms *45°C* (PMN/g)	5×10^2	< 10	< 10
Salmonella sp. (25g)	Absence	Absence	Absence

* BRASIL (1997).
Note: PMN/ g (most probable number/ g)
CFU/ g (Colony format unity/ g)

Conclusions

The chicken burger enriched with 20% of vegetable was sensory more acceptable, due to increase the nutritional value, fibers and reducing the calories when compared to the standard chicken burger.

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Acknowledgements

CEFET- Federal Center of Tecnology of Education-Medianeira – Pr - Brazil
CAPES- Personal Improvement Coordenation of High Level.