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CAPITALIZATION OF BY-PRODUCTS OF MEAT INDUSTRY

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Abstract

The preoccupation for enchasing the quality level of foods, for a long time preservation of their natural characteristics, have determinate the developing of new processing procedures that little affect or non-affect the level and quality of nutrients. By the point of view of raw materials with high nourishing potential supplying for food industry there are a lot of preoccupations for obtaining products that accumulate the highest content of nutrients. So appears, the necessity of changing the idea "area production" with "useful substances per ha". In this study we tried to reveal the positives consequences of processing and using in technology of by-products that raise the nourishing value and improve the sensorial and texture properties.
Keywords: *by-products, MDM, meat semi-preparats*

Introduction

Taking account by the very especial role of feeding for life quality and population health and in the same time of great percent of foods from industrial sphere appears the necessity of establishing the direction from obtaining products that mainly contributions is individual nourishing necessity assurance, for health protection of present and future generation.

There are for the moment, the following direction for action:

- the orientation of raw materials production in the sense of their nourishing potential growth;
- the chemical composition of raw materials and implicit their nourishing value presents great variation by multiples influences: soil , variety, fertilisers, climate for vegetable origin

products and respectively, specie, breed, feeding for animal origin products (Costin 2001, Moulton 2002).

New products elaboration with real health benefits is a recent problem and in the same time is the result of accepting idea that feeding has a major role preventing and/or treating illnesses. This new concept for motivating developing new food stuffs have been mobilized a great number of production units, also organizations in idea to assure food safety, health risk, rapport risk-benefits, efficiency and toxicity evaluation, sanitary settlements (Banu 1997, Bellise 1998, Costin 1999).

Claims on illnesses reducing risks were permitted in USA since 1993. Thus, it was recognized proofs about correlation between nutrients food stuffs or diet aliments and some illnesses, such as: foods with high calcium level and osteoporosis reduced risk; low carbonated fat and cholesterol content and heart diseases; polyalcohol presence and decays risk (Pearson 1986, Banu 2000 and 2004).

In this study we've tried to point out some considerations about the energetic value comparison between classic meat products (beef, pork and poultry) and correspondent recipes made with different percent of MDM. In the last years one of the actual problems is the recovering and using for manufacturing unconventional raw materials, both for economic reason but in the same time for quality improvement.

Experimental

We used for experiments meat products from important meat-processing plants from Bacau, some of them made by beef and pork meat and others by poultry and by soy and MDM addition.

In the laboratory we applied standard chemical methods for analysing;

- 105°C drying for humidity determination
- Kjeldahl method for total protein evaluation
- 550°C ashing for mineral salts determination
- Soxhlet method for lipids extraction and for hydrocarbons determination we made 100% difference (humidity plus proteins plus lipids plus ash plus hydrocarbons make 100).

As apparatus we dispose by Gerhardt unit both for mineralisation and distillation for total protein and potentiometric titration with

calibrated electrode for equivalent point of HCl 0.1 N titration; Selecta drying oven for humidity, Selecta automatisation unit for Soxhlet method using petroleum ether as solvent and 150°C evaporating temperature; Carbolite ash furnace.

Results and Discussions

In the table 1 are presented the mainly physical-chemical parameters of MDM – by-product from poultry meat industry that is recovered with the principal goal to use it like raw material for meat preparats, made from pork, beef and poultry as well as classic preparats or semi-preparats.

Table1. Physical-chemical composition of MDM –raw material

Sample number	Physical-chemical parameters					
	NH_3 [mg/100g]	Protein [%]	Humidity [%]	Fat [%]	Ash [%]	Energetic Value [Kcal/100g]
1	18.12	14.02	62.03	23.19	0.72	273.15
2	14.45	13.53	61.74	23.37	0.74	272.80
3	13.53	12.13	54.80	25.41	0.63	286.00
4	15.85	13.62	56.40	25.38	0.28	291.90
5	21.87	14.48	63.38	19.14	0.68	237.40
6	23.04	14.92	63.05	21.01	0.23	256.56

From the table 1 we may conclude that mechanically deboned meat – MDM represent a good source of nutrients: protein, fat, water in well-balanced proportions. In the same time it has good levels for energetic value that indicate the products we obtained are improved from the point of view of assurance the equilibrium between nutrients and their quality.

In the tables 2 – 4 the indicators values obtained by chemical analysis for examined samples are presented. We also determine NaCl content for his influence on water content, on texture, on time storage and not in the last time healthy influence (cord diseases).

In table 2 are point out values for pre-cooked and poultry – MDM meat products. With one exception the products present energetic value under 200 kcal/100 g product that means are very suitable for persons that need food regime. The protein content doesn't show large

differences or minus differences comparing with products made by traditional technologies. Plus the positive influence of vegetable protein or poultry protein – more assimilable and digestible for age categories: children and ageing. The NaCl content is subscribed to normative, that means under 3% limit.

Table 2. Chemical composition for pre-cooked and poultry products with MDM

Assortments	Physical –chemical parameters					Energetic Value [kcal/100g]
	NaCl [%]	Water [%]	Lipids [%]	Ash [%]	Protein [%]	
Nuggets premium	2.19	53.54	8.56	2.67	13.02	215.28
Schnitzel shaped	2.32	57.95	7.59	2.79	13.67	195.68
Cordon Blue	2.11	58.75	8.06	2.86	14.23	196.06
Cordon Blue - fried	1.66	63.31	5.04	2.21	15.31	114.48
Schnitzel fried - freezed	1.44	65.05	5.49	1.56	17.3	159.18
Filé fried - freezed	1.87	72.55	1.46	3.00	19.24	112.47
Kebab fried - freezed	1.76	72.94	2.09	3.24	20.39	108.86

In tables 3 and 4 are presented the proportions between protein, lipids and water content for some assortments of salami and sausages, made from beef and pork meat. Of course, the recipes predict also adding of vegetable protein and/or MDM, but in very small proportions, comparing with pre-cooked products.

Table 3. Chemical composition and calories per 100 g product for beef and pork salami

Assortments	Physical –chemical parameters				Energetic Value [kcal/100g]
	NaCl [%]	Water [%]	Lipids [%]	Protein [%]	
Salami with ham	1.78	71.27	4.23	13.29	114.34
Pork salami	2.60	61.49	15.00	11.10	204.66
Salami Bucuresti	2.48	53.55	22.32	11.02	277
Salami taranesc	2.41	65.09	24.07	11.03	269.07
Fresh poultry salami	1.78	70.76	3.40	11.48	119.69
Salami vanatoresc	1.92	56.14	25.39	11.68	300.42
Salami de vara	1.54	52.82	25.00	15.82	313.76

Table 4. Chemical composition and calories per 100 g product for assortments of saucisses

Assortments	Physical –chemical parameters				Energetic Value [kcal/100g]
	NaCl [%]	Water [%]	Lipids [%]	Protein [%]	
Cabanos	1.82	50.94	21.14	16.92	282.37
Harghita	2.48	58.85	18.07	12.54	240.00
Polonezi	1.87	66.40	15.08	11.72	201.74
Trandafir oltenesti	2.59	58.87	21.84	13.31	270.00
Muntenia	1.73	62.24	13.65	12.86	212.48
Taranesti	2.15	59.34	9.47	15.47	192.50

As it can be observed, the protein content is better for sausages than salami that means the majority of values subscribe over 12%. From the point of view of lipids content, the situation stays different: the salami presents a higher content, result from he technological conditions.

The main problem of our products still remains the assurance of quality continuity and stability in time.

Conclusions

Using the proteins with modified structure (either chemical or enzymatic methods) and unconventional sources proteins to achieve one or another purpose:

- degradation reaction blocking (Maillard or Lysine-Alanine type compounds);
- proteins functional properties improvement;
- proteins digestibility intensification.

Majority of proteins have hydrophilic amino acids at molecule surface (Lysine, Glutamine, Serine) and hydrophobic amino acids (Phenilalanine, Valine) are molecule interior. Aditionning hydrophobic groups at molecule surface by chemical modifications we obtain structural modifications and also hydrophobic areas.

Obtaining vegetables proteins for food industry consist also in functional properties improvement: dispersability and solubility

intensification, heat treatment resistance improvement, elasticity intensification for a better finite form developing.

Using vegetable proteins or MDM for pre-cooked or meat products is due to solubility improvement and proteic dispersions viscosity rising and also emulsion and foaming capacity improvement. Plus, don't forget the healthy benefits of using vegetable instead animal proteins, soy bean effects concerning phytohormons action.

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