

Piotr Kulawik, Władysław Migdał, Joanna Tkaczewska ©

Institute of Animal Food Processing, University of Agriculture in Cracow, Poland

THE COMPARISON OF BASIC NUTRIENTS AND DRY WEIGHT IN PANGASIOUS CATFISH AND TILAPIA'S MEAT

Introduction.

Since few years, the increasing tendency in fish consumption can be seen on Polish. In 2008 the supply of consumption fishes available on the market was 6,5% higher than in the year 2007. Because of this the increase fish intake to the level of 13 kg/person in equivalent of live fish occurred. Simultaneously in Poland the tendency to decrease the marine fishing level and the amount of production in fishes from aquaculture can be observed. The current situation is due to the increase import of freshwater fishes, mainly *Pangasius* catfish from Vietnam and tilapia from China [Jabłońska-Urbaniak, 2009]. The meat of those two species of fish is very popular among the Polish consumers, mainly because they are available in form of frozen fillets, which are easy to prepare, do not have the specific taste and aroma of fish, so undesirable by many consumer and are available at very attractive price.

Pangasius catfish, known in Poland under the commercial name as panga, is a name used for eight species of fish from the *Pangasius* family. On the market however, are mostly available two species: *Pangasius borceri* and *Pangasius hyptholomace*, both occurring the Mekong Delta geographical region in Vietnam, where they are known under local names as Tra and Basa. To Poland and other countries of European Union, they come mostly in forms of frozen fillets. Those species are very good fitted for breeding, because they grow rapidly, reaching the usual length of 30-40 cm and average weight of 3-4 kg [Polak-Juszczak, 2007]. To Poland *Pangasius* catfish is brought mostly from Vietnam [Jabłońska-Urbaniak, 2009]

Tilapia is a commercial name used mostly for two families: *Tilapia* and *Oreochromis*. Those are mostly lake fishes, which are very adapted to live in closed water tanks. Their undoubtedly breeding advantages are high speed of growing and easiness of reproduction in captivity. Additionally they are resistant to many diseases and easily adapting to different environments [Shiau, 2002]. The above features cause, that those fishes are very popular among the breeders. To Poland tilapia is being imported mostly from China [Jabłońska-Urbaniak, 2009].

Despite the high popularity among the consumers, the meat of those fishes arises many objections on their nutrition value [Bienkiewicz 2003, Polak-Juszczak 2007a]. The additional problem concerned with frozen fillets of such fishes, is the high level of icing in which they are covered. Because of the fact, that the fillets must be frozen exactly in this way, protecting the meat from corruption, the consumer who buys the fillet, pays also for frozen water. With high content of icing, it can turn out that the competitive price of frozen fillets, is not such low for as it can seem.

The aim of work

The aim of this work was to determine the basic composition of frozen fillets from *Pangasius* catfish and tilapia available in Polish stores and to assess the content of icing in which those fillets were covered.

Materials and methods

The tested material were frozen fillets from *Pangasius* catfish and tilapia available in stores in Cracow. The tested fillets came both from stores owned by large retail chains (Makro Cash&Carry, Auchan) as well as from small shops.

The fillets were weighted shortly after purchase, and then left for thawing and removal of icing for one day in refrigerator in the temperature of 4°C, which are the conditions in which the regular consumer would keep it. After one day the fillets were dried from leaching water and then weighted again. The difference in weight before and after thawing was considered as the weight of icing. The recommended by Polish Norms amount of icing should not be less than 2-2,5% of total fillet's weight.

After thawing, fillets were homogenized and then the samples were taken for determination of content of water, ash, proteins and fat. To determine the content of water, the samples were heated in dryer in temperature of 105°C till reaching the constant weight. The determination of ash was performed by combustion of sample in muffle furnace for 6 hours in the temperature of 550°C. The determination of proteins was performed using the Kjeldahl method. The determination of fat was performed using the Soxhlett method. The results of research from individual samples were averaged. From the statistical analyze, the standard deviation was calculated.

Results of researches and discussion

The results of the research were shown in table 1.

Table 1.

The content of basic nutrient in *Pangasius* catfish and tilapia fillet (% of weight).

	<i>Pangasius</i> Catfish			Tilapia		
	Mean	Min	Max	Mean	Min	Max
Icing	26,19 ± 5,74	16,2794	35,3569	26,3 ± 0,31	26,0768	26,5217
Water	86,33 ± 2,35	85,6075	89,1971	84,71 ± 1,47	83,6717	85,7559
Ash	1,49 ± 0,5	1,00412	2,42981	0,84 ± 0,03	0,82202	0,86450
Proteins	12,48±1,43	11,2	15,4	16,91±0,26	16,72	17,09
Fat	1,05 ± 0,49	0,52	1,86	2,1 ± 1,1	1,33	2,88

Icing and water

The average content of icing in *Pangasius* catfish tilapia fillets was similar and was around 26%. It is also worth to point out, to the differences in the amount of icing in individual *Pangasius* catfish fillets. The highest amount of icing was 35,6% and the lowest 16,3%. The amount of water in whole fillets was however lower in tilapias which had exactly 84,71±1,47%. The *Pangasius* catfish had 86,33±2,35% of water in their meat. The content of water in research conducted on *Pangasius* catfish by Polak–Juszczak [2007] was smaller and contained 82,82±1,57.

Ash

The content of ash, was higher for fillets from *Pangasius* catfish, which contained $1,49 \pm 0,5\%$. The tilapia fillets contained $0,84 \pm 0,03$. In the work done by Polak-Juszczak [2007] the *Pangasius* catfish contained $1.12 \pm 0.13\%$ of ash.

Proteins and fat

The content of two main nutrients, which are proteins and fat, was higher in tilapia fillets. Tilapia's meat contained $16,91 \pm 0,26\%$ of proteins meanwhile *Pangasius* catfish contained $12,48 \pm 1,43\%$. The amount of fat, which is one of the main desirable components in fish meat, was twice higher in tilapia fillets ($2,1 \pm 1,1\%$) than in *Pangasius* catfish ($1,05 \pm 0,49\%$).

The content of both proteins and fat in similar research conducted on the same fish species was higher. For *Pangasius* catfish, the amount of proteins contained in fish fillets were $14,61 \pm 1,18\%$ [Polak-Juszczak, 2007] and $20,3\%$ for tilapia fillets [Clement, 1994]. The same case was with fat content where results for *Pangasius* catfish were respectively $1,34 \pm 0,32$ [Polak-Juszczak 2007] and $1,6\%$ [Bienkiewicz, 2003]. The research conducted by Clement [1994] on Nile tilapia showed $5,7\%$ of fat in the fillets of this fish. Such differences in acquired results might be due to including icing as part of the fish fillets content in this presented research.

Still even though tilapia fillet has two times higher amount of fat than *Pangasius* catfish it is lower than in other fishes breded in Poland, such as rainbow trout ($9,6\%$ of fat), carp ($4,2\%$), herring ($10,7\%$) or salmon ($13,6\%$) [Kunachowicz, 2006]. Other fish fillets available on the market from import also contain higher levels of fat. Oilfish and African catfish contain respectively 21.62 ± 0.7 and $5.30 \pm 2.14\%$ of fat [Polak-Juszczak, 2007].

Conclusions

1. The amount of icing in fish fillets was similar in both tested fish species and matched the level of 26% of the whole fillets weight. This might mean that unaware consumers are being tricked into paying 26% for the meat in this fillets.

2. Fillets of *Pangasius* catfish contain more water and ash while less proteins and fat than fillets from tilapia, thus making tilapia more desirable as an nutritional food.

3. Results in this research varied from the results obtained by other scientists. The amount of water and ash in *Pangasius* catfish was higher while the level of proteins and fat was lower.

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