



**JOINT FAO/WHO FOOD STANDARDS PROGRAMME  
CODEX COMMITTEE ON FISH AND FISHERY PRODUCTS**

**Thirty-Second Session**

**Bali, Indonesia**

**1 – 5 October 2012**

**AMENDMENT TO THE STANDARD FOR QUICK FROZEN FISH STICKS (NITROGEN FACTOR FOR SOUTH ATLANTIC HAKE)**

**COMMENTS AT STEP 3**

**UNITED STATES OF AMERICA**

The United States would like to commend South Africa for performing a careful study on South Atlantic hake nitrogen content.

The United States could support an average nitrogen factor based on fresh whole S. Atlantic hake; however we do not support the proposed nitrogen factor based on fish blocks because the nitrogen factor should be based on freshly harvested whole fish in order to be comparable with the other nitrogen factors in the Standard. If added water is significant in fish blocks, then the fact that added water is present should clearly be visible on the label IE “Fish Block xx% Water Added”, but changes in nitrogen content due to processing should not be included in the nitrogen factor for the fish itself. The methodology used to determine nitrogen factors should be uniform for fair trade and nutritive value.

The chemical nitrogen method is used to supplement the Codex official gravimetric method when it is desired to also check if the fish flesh appears to contain added water or other non-fish ingredients. This is discussed in the CCFFP *Discussion Paper on Declaration of “Fish Content” in Fish Sticks – Definition and Method of Analysis* (CX/FFP 02/13), which states:

*However the “fish core” of many products...may not be a true indication of the “real fish” content of a product since the core is frequently derived from fish blocks, which may contain other ingredients or added water.”*

And,

*For most consumers, the amount of fish in a fish product would be understood as the amount of the raw ingredient without any added ingredients (e.g. as fresh whole fish) used to make the product”*

The results of the S. Atlantic hake study support that fish blocks may have less fish protein than fresh whole fish. The degree of difference depends on the process, and appears to be sensitive to the use of fresh water. The study noted that some trimmings that were wetter than normal caused outlying low nitrogen values. Other processing techniques may not add significant water, or may result in a loss of water and a gain in percent protein. To minimize processing variables, it is necessary to always use fresh whole fish for the determination of baseline nitrogen factors for the Codex Fish Stick Standard.

Comment on the Nitrogen Factors in the Standard

Because of the high variance in nitrogen values there are no meaningful differences among the values listed for different species in the Standard, and a single N-factor representing all species would be fair and equally accurate.

Nitrogen values for headed and gutted South Atlantic hake ranged from 2.11 to 3.02, an extremely wide range considering that each value is based on an average of 12 fish. Similar ranges were observed in the studies used to support the “interim” nitrogen factors for white fish species (CX/FFP 02/13) and for Tilapia (CX/FFP 11/31/12). In addition, when studies are repeated, or are performed in a different country, the result can be quite different. Many factors contribute to this high variance; however, the factors of gonad condition, aquaculture vs. wild, and methods of analysis appear to contribute more to nitrogen variance than does the fish species examined. It appears, based on these ranges, that an analysis of the raw data would not find a statistically significant difference in nitrogen content between species. Given that the contribution of important factors to nitrogen content have not yet been resolved, it would be most appropriate to list one nitrogen factor in the Standard based on an average for all species.

Importance of the Codex Officially Adopted Method

Recently a +/- 10% allowance for variance was added to all the nitrogen factors in the Standard. Already built into the Standard’s white fish nitrogen factors is an 8% reduction from the averages found in the studies (see Table 1 compared to Table 2 in CX/FFP 02/13). The tilapia nitrogen factor was not lowered by 8%, but the data for wild tilapia were not included, therefore the fish should be listed as “aquacultured tilapia”, and an additional 8% reduction made to be consistent with the methodology used for other white fish. These adjustments are quite large and bring into question the actual usefulness of the nitrogen method for detecting added water. Water could be added to the fish core; however, unlike other fishery products, there is a limit to how much water can be added without causing the breeding or batter to lose integrity upon cooking, and that level of water may not be detectable by the current nitrogen method. However, even without adding water, a processor could regularly meet the Codex nitrogen levels with significantly less fish content than declared on the label because of the 18% allowance below the average nitrogen levels reported in the studies. Therefore, it is important to emphasize that the Codex Official Reference Method (AOAC 996.15), which measures the actual weight of the fish and the breeding, should always to be used when determining the percent fish content.

Corrections to Section 7.4 “Estimation of Fish Content”

We note that section 7.4 is formatted in a manner that emphasizes the chemical method while the official method may be easily overlooked. We suggest correcting this by underlining the heading “Codex-Adopted Method” and adding a corresponding underlined heading labelled: “Alternative Methods”. The text “**AOAC Official Method 996.15 (End-Product Method)**” should be in bold to correspond with the bold listings for the alternative methods.

Currently:**7.4 ESTIMATION OF FISH CONTENT**

Codex-Adopted Method

AOAC Official Method 996.15 (End-Product Method)

**(1) Chemical Analysis Method (Nitrogen Factor End-Product Method)****(2) Rapid Method Used during Production**With change:**7.4 ESTIMATION OF FISH CONTENT**Codex-Adopted Method:**AOAC Official Method 996.15 (End-Product Method)**

Alternative Methods:**(1) Chemical Analysis Method (Nitrogen Factor End-Product Method)****(2) Rapid Method Used during Production**

The 23<sup>rd</sup> Session of the CCFFP agreed to include adjustment factors to the AOAC Official Method to take into account variability in technique. For example, adhesion of the breading to the fish in precooked products may result in some fish flesh being scrapped off with the breading. Paragraph 13 of the Session Report (ALINORM 99/18) states:

*13. The Committee agreed to include in the standard a reference to AOAC Method 996.15 with an adjustment factor of 2% for raw breaded and batter-dipped products; 4% for precooked products, subject to endorsement by the CCMAS.*

We are not aware of the Committee rescinding this agreement; therefore we request the following correction to Section 7.4 to include the adjustment factors, and a reference to the AOAC method:

**7.4 ESTIMATION OF FISH CONTENT**Codex-Adopted Method:**AOAC Official Method 996.15 (End-Product Method)**

Calculation:

$$\% \text{ Fish Content} = (\text{Wd/Wb}) \times 100 + \text{Adjustment Factor}^*$$

Wd = weight of debattered and/or debreaded test unit

Wb = weight of battered and/or breaded test unit

\*Raw Breaded Frozen Coated Fish and Fishery Products: 2.0%

\*Batter-dipped Frozen Coated Fish and Fishery Products: 2.0%

\*Precooked Frozen Coated Fish and Fishery Products: 4.0%

Reference: J. AOAC Int. 80, 1235(1997)