

Study of these standards should convince a qualified reader that they are sensible and workable. However, any industry standards are completely valueless unless they are implemented by industry policing and enforcement. Enforcement methods may be many and varied, and it is hoped that industry leaders will soon work out the means for practical implementation of the standards which have been adopted.

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## Standards de Calidad en la Industria de Camarones

LAWRENCE W. STRASBURGER

*Food Technologist and Consultant, New Orleans, Louisiana*

### *Abstracto*

Plantas de enlatado de camarones fueron puestas bajo inspección voluntaria del U. S. Food and Drug Administration en 1934. En la actualidad pocas plantas se aprovechan de este servicio en la creencia de que ellos pueden producir productos de alta calidad sin necesidad de supervisión. In 1954 los enlatadores adoptaron standards de grado para el tamaño.

Análisis sobre la calidad de camarones empanizados han demostrado la necesidad por standards para este producto.

Dos Asociaciones de la Florida han instituido standards los cuales han levantado la calidad del camarón fresco producido en ese estado. La calidad se juzga mayormente sobre la mancha negra.

La Asociación Camaronera de las Américas ha adoptado standards voluntarios de calidad para camarones frescos. Estos standards cubren el manejo de los camarones en los botes pesqueros, así como la calidad de los camarones. Es necesario ahora para la industria el poner en efecto estos standards.

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## Voluntary Federal Grade Standards for Fish Sticks

CHARLES BUTLER

*Chief, Technological Section, Branch of Commercial Fisheries,  
U. S. Fish and Wildlife Service, Washington, D. C.*

The phenomenal success of fish sticks in the market place is well known to the fisheries industry. Within the past few years, sales have zoomed from the market test level to an estimated 50 million pounds for this current year. As further evidence of this fish stick popularity, we note that other competing protein foods are climbing aboard the band wagon. Chicken sticks and ham sticks are among the products either on the market or being readied for a sales promotion campaign. If these agricultural products follow the pattern set by that industry in the past, voluntary federal standards and inspection will be an integral part of its production and distribution system. The advantages of food products properly graded and inspected for wholesomeness and accepted as such by the consuming public are rather well established for many

agricultural commodities. You may have noted as a part of the "use more meat" drive now in progress that newspaper advertisements stress the "U. S. graded and inspected" feature for meat and poultry as an inducement to sales building.

At the National Fisheries Institute Convention in Cleveland in April, 1954, the first formal action was taken toward the stabilization of fish sticks at an acceptable quality level through the appointment of a Fish Sticks Committee. This committee includes representatives from the country as a whole. A technical sub-committee was created and instructed to prepare a suggested draft of standards. This sub-committee believes that voluntary grade standards, like those developed and applied to agricultural products by the Agriculture Marketing Service, should be developed for fish sticks.

Part of the Fish and Wildlife Service's technology research program of the past year has been to develop information on voluntary grade standards for several fishery products. Data essential to the evaluation of quality for frozen haddock fillets were accumulated during comparative study of fillets from haddock round-frozen at sea and those from iced, gutted haddock. The data were written up essentially as a voluntary federal standard of quality for use in the research work. Through this haddock study, many of the different problems in working out standards for fisheries products, as contrasted to those of agricultural products for which established standard development procedures are available, were brought out.

Our second study in this field began early last spring when the Maine Sardine Industry sponsored a cooperative project with the United States Fish and Wildlife Service to develop information looking toward voluntary grade standards for canned Maine sardines. Here again our technologists have gained valuable experience in the formulation of the quality requirements for each grade, the definitions from commercial practices of styles of packs, the preliminary field testing of inspection procedures, and the preparation of a working draft of the standard.

The Technology Section's research program, as worked out at an Industry Conference in June, 1954, includes a project to be carried on jointly at the Seattle and the Boston laboratories entitled "Fish Sticks, Storage Characteristics and Quality Standards." This work is an expansion of smaller scale studies begun in 1953 on fish sticks at each of these laboratories. Commercially prepared fish sticks have been purchased for examination and evaluation of their characteristics. Experimental lots of fish sticks are prepared by our staff to supply samples of known history. Among the variables now under study are the effect on the final product of:

- (1) the species of fish, (2) state of freshness of the fish raw material, (3) kind and amount of batter and breading mixtures, (4) frying technique, including type of oil used, its temperature, the frying time, and the oil replacement rate, (5) packaging materials and methods and (6) freezing and frozen storage conditions.

All the commercial products and the experimental lots are examined when first prepared, then periodically examined during the frozen storage period, to establish the essential attributes to be used for the proper quality grading of the sticks. A typical organoleptic examination sheet used by the staff includes the following factors:

(1) Shade or brilliance of color at the "ready-to-eat" stage. Color evaluation is far more precise at this stage than if judged in the frozen or thawed, but not heated, sticks. The shade designations are arbitrarily assigned numerical values ranging from one for a very pale product, differing little from the uncooked item, to 10, for a very dark product not quite at the burned stage. The shade most preferred by the test panel had a value of six. Several commercial lithographed labels of fish sticks were used as guides to designate values within the range from four to seven of this scale.

(2) The appearance, odor, texture and flavor of the breading and its absorbed frying oil. These same observations are then made on the meat of the cooked fish stick.

(3) After these latter characteristics have been graded as excellent, very good, good, fair, poor, or inedible, the over-all grade is assigned. Each characteristic is scored and tabulated separately to prevent several high scores masking a low score given to an undesirable characteristic. Ultimately the descriptive terms are converted to a numerical value so that relative differences of many test samples can be more readily compared.

(4) General remarks on the presence of undesirable features. Bones are objectionable since fish sticks are being promoted for children's lunches. The outer appearance may be marred by the presence of burnt bread crumbs. Dark streaks due to the presence of skin particles or abdominal membranes in the flesh portion are offensive. The breading may be loose from the flesh or it may be soggy from either excessive moisture or frying oil.

Chemical and physical objective evaluations are used to check the opinions of the taste panel. Some of the procedures used include:

(1) Measurement of the oil content of the fish stick and of the bread covering, by solvent extraction.

(2) Measurement of the degree of rancidity of the oil in the fish stick. This test reveals the use of frying oil in poor condition on relatively freshly-prepared sticks or the susceptibility of the oil, in the initially acceptable stored frozen stick, to the development of undesirable changes during storage.

(3) The texture of the thawed fish stick is measured by a device registering the force required to shear through the fish stick. This test is a check on the taste panel's evaluation of the texture of the sticks. Some frozen fishery products develop an undesirably chewy quality, or even a tough texture, during storage.

These observations may be used as a basis for the draft of a voluntary federal standard for fish sticks. It is too early to be sure of all the essential details, since much work remains to be done. However, some idea of the form such a standard might take may be helpful in describing the attack on the problem.

The first item required is a definition of the product. Since there is no mandatory standard of identity to incorporate by reference, some statement descriptive of the product serves as a starting point. The definition should be broad enough to include all the products now being marketed throughout the country, with the matter of diverse styles being covered elsewhere in the standard. For this discussion only sticks of the breaded, fried and frozen style are being considered. The United States Food and Drug Administration regulations on fill of container would, of course, apply to fish sticks, and

their standards of quality would be the minimum level upon which these voluntary grade standards might build to improve the product. Next, the product unit size should be designated and the grade nomenclature established. With these guide lines a description can be given of each attribute of the product, as now marketed, that directly affects its desirability. Sub-headings are usually necessary under the major attributes of appearance, flavor, and absence of defects. The inherent characteristics of the product and workmanship used in the preparation of the raw material and in the process of manufacture, must all be given consideration. A point score system, with a definite range assigned to each attribute used in the measurement of the product's quality, should be established at this stage.

By using the laboratory work and the partially complete data as general guides, a generalized draft of a voluntary federal standard of quality for pre-cooked style fish sticks can be formulated.

A definition of fish sticks is: Items made by applying batter and breading to uniform, rectangular, elongate pieces of flesh from the species of fish indicated on the label, which are deep fried in a suitable oil. (Some statement of the acceptable range in per cent of breading material on the fish sticks would necessarily be a part of the definition, but at present there are not sufficient data upon which to base recommendations for this.)

Product unit size: a fish stick, as defined, with a gross weight per unit of one ounce. (As was stated previously, alternative sizes would be covered in any standard prepared.)

Grade nomenclature and definitions: Grade AA—to be of quality "AA" the product must be of a uniformly golden brown color, and after heating not over 10 per cent, by count, of the units may vary markedly from the predominating color. The odor and flavor shall be that characteristic of good quality fish of the species when fried in a suitable oil. The product shall be uniform as to size, with not more than 10 per cent, by count, of the units consisting of non-uniform or misshaped pieces; no broken pieces are permitted. No carbon specks, bones, skin or scales may be present. Good texture of the product shall include moderately crisp exterior surfaces, no noticeable separation of the breading from the fish portion, and no excessively moist or oily condition in the breaded layer. The fish flesh shall be well-cooked, tender and practically free from sogginess. A point range in the grading scale would be assigned these major attributes. For example, fish sticks that possess good color may be given a score of 17 to 20 points on this attribute. Those having good odor and flavor would score another 26 to 30 points. Fish sticks practically free of the undesirable features listed would be scored in the point range of 26 to 30. Acceptable texture would result in an additional score of 17 to 20 points. A total score of not less than 90 points would be required for the "Grade AA" rating.

Grade A—to be of "A" quality the product differs from "Grade AA" essentially in that the term "good" is replaced by "reasonably good". Not over 20 per cent, by count, of the units may vary from the predominating color; not over 20 per cent of the units may be of irregular or misshaped pieces, with no broken pieces. Exterior surfaces may contain no carbon specks. Texture is slightly less desirable than in "Grade AA", but still reasonably good. The point ranges for this grade might be: color, 13 to 16; odor and flavor, 13 to 16; defects, 22 to 25; and texture, 13 to 16. Minimum total

score for "Grade A" would be 78. A substantial portion of the commercial pack should qualify for this grade.

The remaining grades for fish sticks might be similarly established, possibly with "Grade B" at a score of not less than 60. Any product not rating over 35 would fall into "Grade C", which would be a sub-standard category allowing considerable variation in conformity to color, size and shape. A given per cent of broken sticks, some separation of breadding from the fish and a reasonable amount of carbon specks would be allowed. Considerable loss of the characteristic good flavor and odor might be accepted here and some slight undesirable flavor and texture changes tolerated.

We are continuing the study on standards, in close cooperation with the industry subcommittee, to insure a realistic and workable standard for use if the government is asked to initiate this valuable aid in the marketing of this fishery product.

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## **Standards Voluntarios Federales para Croquetas de Pescado**

CHARLES BUTLER

*U. S. Fish and Wildlife Service, Washington, D. C.*

### *Abstracto*

El éxito fenomenal de las croquetas de pescado en el mercado debe ser fomentado para asegurar aceptación entusiástica de este nuevo producto.

Con este fin, un grupo de productores en la industria organizó un Comité de las Croquetas de Pescado en la Convención de Cleveland en abril de 1954. Este Comité pidió da cooperación del Fish and Wildlife Service para obtener información sobre standards voluntarios federales para croquetas de pescado.

Los standards se basan sobre el siguiente criterio.

- a) El color de las croquetas
- b) La apariencia, color, textura y sabor de la harina y aceite así como la carne
- c) Defectos presentes; por ejemplo, presencia de espinas, piel, manchas oscuras y otras características no deseables.

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## **How Voluntary Quality Standards Work in the Frozen Fruit and Vegetable Industry**

HARRY K. SCHAUFFLER

*Executive Director, National Wholesale Frozen Food Distributors Assn.  
New York, N. Y.*

Something like the notes of reveille which awaken a slumbering military camp to action, I would like to sound off a few preliminary notes to remind