AMERICAN SPICE TRADE ASSOCIATION, INC.

2025 M Street, NW • Suite 800
Washington, DC 20036
Tel: 202-367-1127 • Fax: 202-367-2127
E-mail: info@astaspice.org
Web: www.astaspice.org

Felicia B. Billingslea
Director, Food Labeling and Standards Staff
Office of Nutritional Products, Labeling and Dietary Supplements
Food and Drug Administration
5100 Paint Branch Parkway
College Park, Maryland 20740

January 7, 2008

Dear Ms. Billingslea:

The American Spice Trade Association (ASTA) is a trade association that represents the spice industry in the United States. ASTA was founded in 1907 and represents the interests of approximately 175 members including companies that grow, dehydrate, and process spices. ASTA's members include U.S.-based agents, brokers and importers, companies based outside of the U.S. that grow spices and ship them to the U.S., and other companies associated with the U.S. spice industry. ASTA members manufacture and market more than 90% of the spices sold at retail and to food processors.

ASTA is working with the National Seasoning Manufacturers Association (NSMA) to resolve the issues associated with the appropriate labeling of paprika and foods containing paprika that are addressed in this letter. NSMA was founded in 1973 to represent the interests of seasonings manufacturers in the United States. ASTA and NSMA share a number of members.

ASTA and NSMA support the principle embodied in the Food and Drug Administration's food labeling regulations that consumers should be provided with accurate and complete information when making choices on which foods to purchase. Paprika presents food labeling challenges due to its two functions in food as a spice used to season food and as a color additive. However, the complexities reflected in FDA's labeling regulations relevant to paprika and foods containing paprika present an opportunity for clarification. We would like to suggest ways to clarify these labeling issues within the framework of FDA's existing regulations and with your assistance provide guidance to the spice industry.

We greatly appreciate the opportunity to have discussed with you and your staff issues associated with the use and labeling of paprika during our meetings on 12 January and 21 June 2007. As we discussed during our meeting in June, we would like to provide you with additional information on this subject and suggest some ways to clarify the FDA's existing labeling regulations.

Paprika

Paprika is one of the most commonly consumed spices in the world. Paprika is the dried, milled pods of sweet, mild *Capsicum* peppers, specifically, the species *Capsicum annum*. Within this species, there are many varieties of peppers used to produce paprika which vary in "heat" and color. It is cultivated in the United States, Hungary, Spain, South Africa, India, China, Mexico, and in several countries in South America. More information on paprika is available in the ASTA Paprika Monograph (attached).

Paprika is cited by the Food and Drug Administration (FDA) as an example of a spice in the agency's definition of "spice" at 21 CFR 101.22(a)(2). A key part of the FDA definition of "spice" is that

> ". . . spice means any aromatic vegetable substance in the whole, broken, or ground form . . . whose significant function in food is seasoning rather than nutritional; that is true to name; and from which no portion of any volatile oil or other flavoring principle has been removed." (Emphasis added).

Paprika has two functions when added to food. It is used as a spice to season food with its mild "hot" peppery flavor, and it is used to impart color to foods. Both uses are recognized by FDA in its regulation of paprika. Paprika is listed by FDA as a spice (21 CFR 182.10), a spice oleoresin (21 CR 182.20), and as a color additive (21 CFR 73.340 for ground paprika and 21 CFR 73.345 for paprika oleoresin). Its dual function in food as a spice and a color additive is also recognized by FDA in the agency's food labeling regulations (21 CFR 101.22(a)(2)).

Paprika is used by consumers in its ground form, the form sold at retail. Consumers use ground paprika for both its spice and coloring properties. For some foods prepared by consumers in the home, such as chicken paprikash, paprika serves as the characteristic seasoning. For others, such as deviled eggs, paprika serves primarily as a garnish providing a characteristic coloring element to the food. In all instances of consumer use of ground paprika, it is highly likely that consumers believe that they are using 100% ground paprika.

Food processors use the ground form of paprika and paprika oleoresin with the ground form used for paprika's seasoning and coloring properties and the oleoresin used exclusively for its coloring properties.

The ground form of paprika is prepared by simple grinding of dried capsicum pods to a desired particle size. Spice and food processors often blend the various varieties of ground paprika, which vary in "heat" and color, to achieve desired seasoning and color effects. For example, ground paprika from one variety with a bright red shade may be blended with ground paprika from another variety with more of a brown shade to produce a desired intermediate shade. *The same principle applies to the blending of*

different varieties to achieve desired levels of the seasoning effect commonly known as "heat." Color and heat scales assist in the standardization of ground paprika as described in the ASTA Paprika Monograph (attached).

The color of ground paprika can be stabilized by the addition of ethoxyquin at levels not in excess of 100 ppm (21 CFR 172.140) and its presence should be declared when ground paprika is sold in bulk or at retail. At levels typically used in ground paprika ethoxyquin has no functional effect in a food to which paprika is added and therefore can be considered a processing aid and need not be declared on the label of the food containing paprika consistent with 21 CFR 101.100(a)(3)(*c*).

Silicon dioxide, an anti-caking agent (21 CFR 172.480), may be added in small amounts to assist in the consistent flow of ground paprika. Ground paprika should declare the presence of silicon dioxide when it is sold in bulk or at retail but it has no functional effect in a food to which ground paprika is added and therefore can be considered a processing aid and need not be declared on the label of the food containing paprika consistent with 21 CFR 101.100(a)(3)(*c*).

Defatted Paprika

"Defatted paprika" is a term used to describe the material remaining after ground paprika is extracted with a solvent. The extraction is performed to remove the color and flavoring principles from paprika as a first step in preparing paprika oleoresin – the coloring materials removed from the paprika during the extraction become paprika oleoresin. Therefore, defatted paprika contains none of the materials that impart color or flavor to paprika, and in 1997 FDA affirmed that "defatted paprika" is an appropriate term to describe this material (FDA/Boyd, 15 September 1997-attached).

In 1998, FDA was informed that defatted paprika was determined to be generally recognized as safe under its conditions of intended use as a color additive diluent consistent with Section 201(s) of the Federal Food, Drug, and Cosmetic Act and the agency's regulations governing color additive diluents (21 CFR 73.1(a)). FDA affirmed this interpretation in its letter dated 8 May 1998 (FDA/Wood, 8 May 1998-attached). It appears that the specific intended use of defatted paprika is as a color additive diluent to be added to paprika when paprika is used as a color additive.

Therefore, it appears that the regulatory status of defatted paprika is that the material's common or usual name is "defatted paprika" and that there is regulatory authority for its use as a color additive diluent to be added to paprika when paprika is used as a color additive. Regulatory authority for other uses, such as a bulking agent in seasoning blends, does not appear to exist.

The Labeling of Paprika and Foods Containing Paprika

FDA recognizes the two functions of paprika, as a spice and as a color additive, in its regulations governing the labeling of paprika itself and of the foods to which it is added (21 CFR Sections 73.340, 73.345, 101.22(a)(2), 182.10, and 182.20). The two forms of paprika, ground paprika and paprika oleoresin, are marketed to two distinct

markets, the retail market in which consumers purchase ground paprika for use in the home, and the food processing market in which food manufacturers purchase ground paprika and paprika oleoresin for addition to food that will itself then be sold to the consumer. Paprika oleoresin is not marketed to consumers for use in the home.

Ground Paprika Sold at Retail and for Food Processing

The common or usual name for the dried, milled pods of sweet, mild *Capsicum* peppers, specifically, the species *Capsicum annum,* is "paprika." FDA's labeling regulations mandate that both paprika sold at retail and paprika sold for food processing fully and accurately declare the identity of the materials being represented as paprika.

If the material is 100% ground paprika with no substances added other than permitted materials such as ethoxyquin and silicon dioxide then the material may be represented as "Paprika," "100% Paprika" or as "Pure Paprika" on the principal display panel of the container if it is paprika sold at retail, or on the bulk container label if the paprika is sold for food processing. The ingredient statement for paprika sold at retail should state "paprika" as should the bulk label with the label also including other functional materials such as ethoxyquin and silicon dioxide.

If the material is ground paprika plus other paprika-derived substances such as defatted paprika then the principal display panel for the product should not be labeled as "Paprika," "100% Paprika," "Pure Paprika" or a similar description and should state "paprika with defatted paprika" as should the bulk label. The statement of ingredients for both the product sold at retail and sold for food processing should state "paprika, defatted paprika" plus any other ingredients that are included in the material such as ethoxyquin and silicon dioxide.

Paprika Oleoresin Sold for Food Processing

The common or usual name for the oleoresin derived from the solvent extraction of ground paprika is "paprika oleoresin." The principal display panel for paprika oleoresin sold for food processing should state "paprika oleoresin" and the ingredient statement should also state "paprika oleoresin" plus any other ingredients (e.g. permitted preservatives) that are included.

Foods Containing Ground Paprika

Foods may contain ground paprika for both its seasoning and coloring properties and this is reflected in the FDA's labeling regulations requiring the declaration of paprika as "spice and coloring" (21 CFR 101.22(a)(2). The agency's regulations were developed and promulgated in the 1960s long before the product defatted paprika was developed and marketed in the 1990s and therefore do not reflect the impact of this new product. The FDA's existing regulations provide an opportunity for clarification. Because 100% ground paprika is most likely to be used for both its seasoning and coloring properties, ASTA suggests that it is appropriate to label foods containing 100% ground paprika as follows:

- Foods containing 100% ground paprika may list the paprika as "paprika" or "spice" in the ingredient line if the paprika is used for its seasoning properties, and as "spice and coloring" or "paprika" if the paprika is used to impart color.

Because ground paprika containing defatted paprika is most likely to be used to impart color to foods ASTA suggests that it is appropriate to label foods containing ground paprika that includes defatted paprika as follows:

- Foods containing ground paprika that contains defatted paprika may list "colored with paprika" or "artificially colored" or "color added" in the ingredient line.

Foods Containing Paprika Oleoresin

Paprika oleoresin is sold only for food processing and is not an item of commerce at retail. Paprika oleoresin is used only to impart color and is not used as a spice to flavor food. In fact, paprika oleoresin has little if any flavor as the flavoring principles are removed during the extraction process used to manufacture the oleoresin. Therefore, it is appropriate that foods containing paprika oleoresin be labeled as required in 21 CFR 101.22(k)(2) which states:

> Color additives not subject to certification may be declared as "Artificial Color," "Artificial Color Added," or "Color Added" (or by an equally informative term that makes clear that a color additive has been used in the food). Alternatively, such color additive may be declared as "Colored with ____" or "_____ color" the blank to be filled with the name of the color additive listed in the applicable regulation in Part 73.

It is likely that of the labeling choices listed in 21 CFR 101.22(k)(2), "color added," "colored with paprika oleoresin" or "paprika oleoresin color" would be most attractive to food processors.

Conclusions and Request for FDA Clarification on the Appropriate Labeling of Paprika and Foods Containing Paprika

The existing FDA regulations governing the labeling of paprika and foods containing paprika are consistent with the following principles:

- Ground paprika sold in bulk and at retail should accurately and fully disclose contents. If the paprika contains defatted paprika, or other constituents, the identity of the constituents should be declared.

- Foods containing added paprika, oleoresin or ground, should accurately describe the presence and function of the paprika.

We request that FDA evaluate the following conclusions and express an opinion on the validity of each conclusion related to the appropriate labeling of paprika, both ground and the oleoresin, and foods containing ground paprika and paprika oleoresin.

Labeling of Ground Paprika

Ground paprika sold as such should be labeled as "ground paprika" both in bulk and at retail with the presence of defatted paprika declared in the ingredient statement.

- Only 100% ground paprika may be labeled as "100% Paprika," "Pure Paprika" or another descriptive term implying that the paprika contains nothing other than ground paprika plus permitted materials such as exthoxyquin and silicon dioxide.
- This is consistent with existing regulations for bulk labeling of color additives at 21 CFR 70.25, with the food labeling regulations at 21 CFR 101.22, and with the ingredient declaration requirements at 21 CFR 101.4.

Labeling of Paprika Oleoresin

Paprika oleoresin's only use is as a color additive for food processing and should be labeled in bulk as "paprika oleoresin." Paprika oleoresin is not a retail product and therefore retail product labeling issues aren't relevant.

Labeling of Foods Containing Paprika

Foods containing paprika oleoresin may indicate its presence consistent with the color labeling regulations at 21 CFR 101.22(k)(2) by indicating the presence of paprika oleoresin using permitted terms such as "color added," "colored with paprika oleoresin" or "paprika oleoresin color" in the ingredient line.

Foods containing 100% ground paprika may list the paprika as "paprika" or "spice" in the ingredient line if the paprika is used for its seasoning properties, and as "spice and coloring" or "paprika" if the paprika is used to impart color.

Foods containing ground paprika that contains the color additive diluent defatted paprika may list "colored with paprika" or "artificially colored" or "color added" in the ingredient line.

ASTA and NSMA would appreciate the opportunity to discuss these matters with you further and to come to a resolution on a clear and enforceable interpretation of the FDA's labeling regulations for paprika and foods containing paprika.

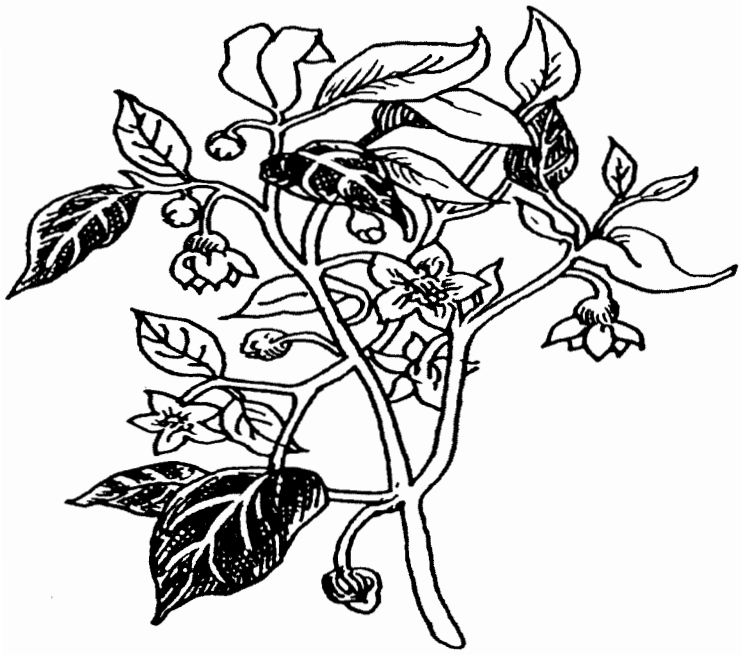
Sincerely,

Cheryl Deem
Executive Director, American Spice Trade Association

Attachments

- ASTA Paprika Monograph.
- Letter dated 15 September 1997 from FDA to Boyd.
- Letter dated 8 May 1998 from FDA to Wood.

PAPRIKA MONOGRAPH
Capsicum annum L.



DEFINITION

I. OVERVIEW

Paprikas are classified as Solanaceae. It is an annual plant and is much like a shrub with a woody stem and single white flowers. They are closely related to tomato, nightshade, potato and tobacco. Paprika is a long fruited, sweet, mild or low pungent variety of capsicum. It is a unique spice in that it always refers to the dried, milled pods of sweet, mild capsicum product. The genus is capsicum and the species is *Capsicum annum*. Within this species there are many different varieties of peppers used to produce paprika. Sonora is one of the most popular varieties used in the Southwestern United States because of its extractable color, yield, and flavor. It is produced by processing the mild red chili pods of *Capsicum annum* and is used largely to add color and/or flavor to foods. Paprika is valued mostly for its high color and mild flavor. Paprika is one of three most popular seasonings and is used both industrially and in the home.

Today, Paprika is one of the most consumed spices in the world. It is cultivated worldwide in Mexico, South America, Zimbabwe in South Africa, Spain, Hungary and the United States. Other countries have started growing paprika like Israel, India and China. Spain is the biggest importer of raw material, and the biggest exporter of the final products including ground paprika and Oleoresin Paprika. The United States, and European countries such as Germany, and the United Kingdom and the Netherlands are the largest users of oleoresin paprika.

Historically, Hungary has been the second supplier of imported paprika, but in the past few years the bulk of their crop has been sold in Europe. In recent years, Hungary has also produced sweet paprika to suit the requirements of U.S. buyers.

The production of paprika in South Africa is still reasonably young, but it has expanded quickly with a growing market demand. During the recent few years Zimbabwe and South Africa have produced between them the equivalent of a third of the world production and more than 85% of the Southern Hemisphere production.

Countries like Peru and Chile have increased their production and they are supplying raw material at very competitive price levels.

The southwestern United States have been the major suppliers of paprika to the American market.

II. HISTORY

Etymology of the word Paprika: The word capsicum is thought to be of Latin origin. In the 1500s, Pepper was called pimiento or pimienton in Spain, Sweet pepper is now called pimiento as a whole fruit and pimienton in the ground form in that country. The Greeks called the fruit peperi or piperi, which is the ancient name for black pepper. In

the Balkans the fruit was called peperke, piperke, or paparka. Hungary had changed the name to paprika by 1569.

Most likely, paprika originated in Central America or the Caribbean as a round fruit and was then taken to Turkey and then Hungary by explorers and invaders. Paprika now grows throughout the world in temperate climates.

When the Spaniards came to the New World, they were searching for black pepper of Asian origin. What they found was capsicum peppers which the native Indians had been cultivating for centuries in America. In 1493, Columbus brought back a variety of capsicum peppers. As these peppers were grown in different climates and soils throughout the world they were modified throughout the world.

Paprika was brought into Hungary after peppers were brought there during an invasion by Turkey. There, milder varieties or paprika evolved. In the 1500s, peppers revolutionized Slavic food preparation. Napoleon had placed an embargo and this set the stage for paprika growers in Hungary to prosper. The People of Europe used this as a substitute for black pepper when the black pepper that they craved was no longer available. In Spain, the new generations of peppers were used as condiments throughout Europe, Asia, and Africa.

Paprika reached the New World in the early 1800s and was called "tomato pepper" to describe this capsicum with no pungency. The Bell Peppers probably were developed from these selections.

III. CLASSIFICATION

Paprikas are classified in the Solanaceae family. They are closely related to the tomato, nightshade, potato and tobacco.

Hungarian paprika is ground powder from long fruits. It is known for its unique flavor and slight pungency. It can be described as pleasantly hot, but appealing taste. This paprika is bright red in appearance.

Spanish paprika is produced from a more round fruit and has a sweet flavor with a characteristic more fermented and piquant flavor. It is coarser in grinds, reddish-brown in color and used very much in the meat industry.

United States paprika is characteristically a finer grind and more red/orange. Like Spanish paprika, domestic paprika is mild and sweet in flavor.

Paprika is also grown in Morocco, Yugoslavia, and Bulgaria in Europe, these are close in flavor and color profile to sweet Spanish paprika.

IV. MEDICINAL USES

The ancient Mayans held the sweet fruit in their mouths as a cure for infected gums. The effectiveness of this practice is now attributed to the high vitamin C content of sweet peppers. Although it has not been scientifically proven, it is currently believed

that vitamin C may aid in the prevention of gum disease. It has been used throughout the centuries as a fruit that promotes good health and resistance to disease.
Cosmetic Use: Carotenoids from sweet peppers are used for coloring cosmetics and drugs as a natural coloring agent.

AGRONOMIC FACTORS

Paprika is long fruited, sweet, mild or low pungent variety of capsicum. It is an annual plant and is much like a shrub with a woody stem and single white flowers.

United States Paprika
1) Current Production
In the United States, paprika is grown in the Southwestern United States. It is primarily grown in New Mexico in the Mesilla, Pecos, and Mimbres Valleys. It is also grown in Texas and Arizona. Paprika cultivation in the Mesilla Valley dates back to the Aztecs.

2) Breeding and Selection
Paprika varieties are chosen to meet specific standards for color, flavor, pod size and plant yield, ease of picking and resistance to disease. Paprika is grown from seed sown in the soil or sown in hothouses to be transplanted to the field as seedlings.

3) Growing Conditions
Sandy or clay, warm soil with good drainage is preferred. Weeding and frequent cultivation are required for these plants. Planting is in late February to April.

4) Harvest
Hot, dry weather is favorable during the harvest and the fully matured vine dried fruits are preferred for picking. Several pickings are possible. Late September through December or January depending on weather conditions. In the United States, there is normally no curing prior to drying.

Hungarian Paprika
1) Current Production
Hungarian Paprika is grown in two main growing areas located in southern Hungary, one centered on Szeged, on the Tisza River on the Yugoslav border, and the other one in the neighborhood of Kalosca, on the Danube.

2) Breeding and Selection
Paprika varieties are chosen to meet specific standards for color, flavor, pod size and plant yield, ease of picking and resistance to disease. Paprika is grown from seed sown in the soil or sown in hothouses to be transplanted to the field as seedlings.

3) Growing Conditions
Sandy or clay, warm soil with good drainage is preferred. Weeding and frequent cultivation are required for these plants.

4) Harvest
Hot, dry weather is favorable during the harvest and the fully matured vine dried fruits are preferred for picking. Several pickings are possible. The fruits are harvested as they reach maturity, in September and October. In European countries, the paprika pods are cured for 3 to 25 days before drying. This curing involved hanging the pods in long strands or piling them in windows under shelter.

The methods employed for paprika production in Yugoslavia, Bulgaria, Romania, and Czechoslovakia is similar to those of Hungary.

Spanish Paprika
1) Current Production
Spanish paprika is cultivated mainly in Murcia and in the regions of Andalusia and Estramadura.

2) Breeding and Selection
Paprika varieties are chosen to meet specific standards for color, flavor, pod size and plant yield, ease of picking and resistance to disease. Paprika is grown from seed sown in the soil or sown in hothouses to be transplanted to the field as seedlings.

3) Growing Conditions
Sandy or clay, warm soil with good drainage is preferred. Weeding and frequent cultivation are required for these plants.

4) Harvest
Hot, dry weather is favorable during the harvest and the fully matured vine dried fruits are preferred for picking. Several pickings are possible. The fruits are collected as they become ripe between the first days of September and last days of October. In European countries, the paprika pods are cured for 3 to 25 days before drying. This curing involved hanging the pods in long strands or piling them in windows under shelter.

Peruvian Paprika
1) Current Production
Paprika in Peru is an agricultural resource that is grown in the Coastal region.

2) Breeding and Selection
Paprika varieties are chosen to meet specific standards for color, flavor, pod size and plant yield, ease of picking and resistance to disease. Paprika is grown from seed sown in the soil or sown in hothouses to be transplanted to the field as seedlings.

2) Growing Conditions
Sandy or clay, warm soil with good drainage is preferred. Weeding and frequent cultivation are required for these plants.

3) Harvest
Hot, dry weather is favorable during the harvest and the fully matured vine dried fruits are preferred for picking. Several pickings are possible.

South African Paprika

1) Current Production

Paprika in South Africa is produced mainly in Zimbabwe.

2) Breeding and Selection

Paprika varieties are chosen to meet specific standards for color, flavor, pod size and plant yield, ease of picking and resistance to disease. Paprika is grown from seed sown in the soil or sown in hothouses to be transplanted to the field as seedlings.

3) Growing Conditions

Sandy or clay, warm soil with good drainage is preferred. Weeding and frequent cultivation are required for these plants. The paprika is planted during the months of September and October, Further north, the paprika is only planted late in November before their rain season

4) Harvest

Hot, dry weather is favorable during the harvest and the fully matured vine dried fruits are preferred for picking. Several pickings are possible. harvested from February until July. Further north, harvested between May and October.

In the past, the US requirements for paprika were largely imported from Hungary, Spain, Yugoslavia, Morocco, and Bulgaria.

This has changed. New Mexico, Arizona, California, and Texas now provide more paprika to the US than any given foreign country. The US produces very sweet paprika as well as paprika with slight pungency. This paprika is mechanically dried and allows for providing product throughout the year that is standardized in flavor, color and pungency.

Primarily, this product is hand harvested although machine harvesting is being used more and more due to labor shortages in the southwest. The whole dried, mature pods are picked off the plants. The fresh raw material is brought into dehydration facilities where the chili is fed into the production line through a draper. There are several cleaning steps: Leaf and trash removal, rock tanks, inspection and sorting. It then goes through cutters, dryers, milling and blending operations. This is followed by packaging and storage.

Methods of Dehydration: In a heated building 2-3 days may be needed to remove 85% of the moisture. In the US, tunnel dryers or belt dryers are often used. This allows drying to take place in 2-5 hours. In the United States, 2 to 5 hours drying time is ideal to retain surface color values. It is also important to control the drying time to maximize surface color and extractable color. In some countries, sun drying is used. Pods are spread in thin layers onto a tarp and the pods can be dried in 5 to 15 days depending on weather conditions. In the United States, there is normally no curing prior to drying. In European countries, the paprika pods are cured for 3 to 25 days before drying. This curing involved hanging the pods in long strands or piling them in windows under shelter.

QUALITY CRITERIA

Extractable Color: The quality of paprika is assessed largely by its oil extractable color. Paprika provides a bright red to orange or red/orange color in an oil base. This color is due to the oil soluble carotenoids (capsanthin and capsorubin and Beta-carotene) that are extracted in acetone or alcohol as well. There is very reproducible and proven ASTA method using a spectrophotometer, for measuring this extractable color. ASTA color is often a critical criteria for rating paprika. Commercially available Industry standard for ASTA color are from 65 ASTA up to 180 ASTA. As a rule, the higher ASTA color, the more expensive the paprika. Asta color is very important for any application that involves an oil or fat based product as this is where the extractable color becomes evident. Acceptable ASTA color ranges are specific for a given application.

Visual Color: This is the color that the eye sees. Paprika gets its vivid red color from carotenoids in the pod. These are red and yellow pigments including carotene (also found in carrots) and capsanthin.

This has traditionally been measured by an Agtron Colorimeter instrument; however, L,a,b color systems, such as Hunter, are being used more in the industry to measure this color. Depending on the growing area, processing conditions and variety, the visual color can be a very deep red to a very bright red/orange or a red/brown color.

Flavor: Paprika has a sweet fragrant flavor and odor.

Pungency or Heat: The pungency, or mouth warming sensation, is due to capsaicinoids, which include the chemical capsaicin. This is measured by HPLC or organoleptically. Typical pungency ranges or paprikas are 0 to 500 Scoville Heat Units, although there are paprikas with higher pungencies than that. The higher pungencies of these paprikas are generally classified as chili peppers.

Mesh Size: Standard mesh sizes are USS #30 and USS #40, there are fine grinds and extra fine grinds as well (USS#60, 80, 100), used for specific applications.

Moisture: Typically a range of 9 to 12% is used for maximum ASTA color retention and prevention of microbiological growth. This can vary depending on grind size as the finer grinds will have a lower moisture level and will be more susceptible to losing ASTA color over time. Water activity is starting to be used more in this industry as a measure of available *water* and is a better attribute to measure for prevention of mold outgrowth.

Bulk Index: Control of Bulk Index is of concern for applications of packaging paprika into retail sale clear bottles. The bulk index must be correct to allow for a good appearance in the packaging while meeting label declarations.

Additives: In the US ethoxyquin is an approved additive (at 100 ppm maximum) commonly used to preserve ASTA color in paprika. There are other methods of packaging and filling these products, such as using a Nitrogen flush and barrier packaging) that can be used to preserve color without the use of added ethoxyquin.

Silicon dioxide (2% maximum) is used as a free flow agent as the nature of this product is to cake up over time.

I. CLEANLINESS SPECIFICATION

ASTA Cleanliness specifications listed below are intended to insure that these spices have been properly handled and stored. The Paprika must comply with the below specifications before they can be introduced into commerce or further processed. The level of contaminants permitted under these specifications must fall below those shown on the following table, except for the column "Whole Insects, Dead" which cannot exceed the limits shown:

Spices	Whole Insects, Dead	Insect Fragments	Mites	Other Insects	Rats/ Mouse Hairs	Animal Hairs
Ground Paprika		Average of more than 75 fragments/25g			Average of more than 11 rodent hairs/25g	

Micro analytical/Cleanliness: The insect fragment, rodent hair, and mold counts are indicators of proper harvest, processing and storage conditions. These are not necessarily harmful, but they can indicate whether sound pods were harvested, properly cleaned and washed and stored under sanitary conditions.

FDA Defect Action Levels for paprika are:

Mold	Average mold count is more than 20%
Insect filth	Average of more than 75 insect fragments per 25 grams
Rodent filth	Average of more than 11 rodent hairs per 25 grams

Defect Source: Mold – pre-harvest and/or post harvest mold infection. Insect fragments – pre-harvest and/or post harvest and/or processing insect infestation. Rodent hair – pre-harvest and/or post harvest and/or processing contamination with animal hair or excreta. Significance: Aesthetic, Mold may contain mycotoxin producing fungi.

II. CHEMICAL STANDARDS

Since a specification for ground paprika is dictated by its end-use, there is no one specification that will serve all purposes. Below is a general guideline for ground paprika:

The Canadian Government has set minimum criteria, in Division 7 of the Food and Drug Regulations for key attributes of spices.

The International Organization for Standardization (ISO) has set forth key attribute minima. Caution needs to be exercised when comparing the values. ISO Standards

are set on a dry-weight basis and will therefore appear slightly higher than either Canadian or US requirements.

Paprika	US Guideline	Canada	ISO
Acid-Insoluble Ash		1.0% Max.	0.5-1.6% Max
Total Ash		8.5% Max.	6.5-10.0% Max
Moisture	12% Max.	12% Max.	11.0% Max

III. MICROBIAL REDUCTION

Micro-organisms in paprika can lead to spoilage or disease if an infected crop is incorporated in food products. Microbial contamination is often attributed to the lack of good sanitary conditions in some countries where spices are produced and processed. Even paprika processed in the United States may have total plate count of 1 million/g.

Treating paprika with ethylene oxide can reduce microbial counts by up to 90%. Since traces of ethylene oxide remain on spices after treatment, use of the gas is not an acceptable practice for many European countries. Propylene oxide is an alternative to ethylene oxide, but is less effective at reducing microbes. Sterilization by heat or steam sometimes degrades the product of surface color and other attributes. Microwave treatment of paprika has been attempted, but does not effectively reduce microbe levels. Ultraviolet radiation does not always have enough penetrating power to decontaminate. The most effective way to reduce or eliminate microbes in paprika and least likely to cause changes in the product is irradiation.

Microbiology: Paprika is commercially available untreated, gas treated with ethylene, steam sterilized or irradiated. Microwave treatments are being perfected as well for these products. The microbiological counts that are required will depend on the application in the final food product. Normally the paprika is bought pathogen free. Aerobic plate counts can range from <10 to 100,000 with bacteria treatments up to well over several million in untreated product. These counts can vary from crop year to crop year depending on the harvest.

Pesticide Analysis: Must be assured that product complies with regulations of each country.

Labeling: FDA rules specify that spices must be the actual products described by their common name on the package label and that no volatile oils or other source of flavor can be removed. The identity of spice is established by their botanical name. In the United States, capsicum oleoresins and extracts may be labeled "Natural Flavor" as provided for in 21 Code of Federal Regulations (CFR), Part 101, Subsection 101.22

EXTRACTIVES

I. OLEORESINS

Oleoresin Paprika: Oleoresin paprika is obtained by solvent extraction of the paprika. It is a natural vegetable coloring agent and is used in many food applications in which it provides an excellent natural color for red or orange color or tint. This product is very widely used in sausages, meat products and salad dressings.

II. ESSENTIAL OILS

Paprika contains no volatile oils. High ASTA color paprika is used for extractor material. Standard Oleoresins are dark red and without pungency. Antioxidants can also be added to preserve the color as oleoresins can be very sensitive to light, oxidation, and heat. Oleoresins are available for both oil soluble and water soluble applications.

There is a direct relationship between the ASTA color of paprika and the ASTA color of oleoresin paprika. In products where these items are used only for color and not for flavor or texture, substitutions can often be made between ground paprika and oleoresin paprika on a color-pound basis to achieve the same color in the finished product.

ALLERGEN STATEMENT

Paprika is not listed as an allergen by the Codex Alimentarius Commission. However, some spices may be considered allergens in certain countries. Please check all relevant regulations.

STORAGE CONDITIONS

Store spices in containers that are airtight. Keep in cool dry areas with minimal exposure to sunlight to maintain flavor and color.

Excessive heat can volatize and dissipate aromatic essential oils, and high humidity may cause caking. Exposure to light may also reduce color values especially in the case paprika.

Extractives: Should be stored in cool, dry conditions. Containers should be as full as possible and tightly sealed. For light-sensitive products, opaque containers are essential.

The storage area should be free of insects. All open doors and windows should be screened and all drains should have covers. There should be no holes or cracks where insects may enter the storage area and find harborage. It is highly recommended to have a strong Integrated Pest Management system in place.

Packaging: Industry standards are fiber drums with a poly liner, bag in box, or lined bags. Packaging material can be used with additional barrier and Nitrogen flush to preserve freshness.

Shelf-Life: Commercial product is 12 months at 38° F and 60% maximum relative humidity. If stored at temperatures above 68° F, the ground product will be reduced in extractable color and in flavor. Paprika that has not been properly stored can develop stale, bitter flavors.

COOKING USES

Commercial: Paprika is used extensively as a natural colorant. It is used in meat products such as sausages, bologna, minced meat specialties and hot dogs, seasoning blends, tomato sauces, pickled products, chesses, salad dressings, condiments, and gelatin.

Garnish: Paprika is used as colorful garnish on many foods, including meats and sea foods, sauces, eggs, vegetable dishes, appetizers, dips, cole slaw, goulashes, soups and potatoes.

Livestock Feed: The defatted paprika from production of paprika oleoresins and other capsicums is used in the dairy and poultry industry as an addition to livestock feed. The color of an egg yolk as well as the color of chicken can be influenced by the addition of paprika to feed.

NUTRITION STATEMENT

Paprika was the first fruit from which pure vitamin C, ascorbic acid, was produced. This happened in 1928 in Hungary and came from the work of Nobel Prize winner Albert Szent-Gyorgyi, M.D., Ph.D. Sweet peppers are an excellent source of vitamin C, richer in ascorbic acid than citrus fruits. Capsicums are also high in vitamin A (carotene), E and B complex vitamins. The Nutritional Composition can be found on the USDA website: http://www.nal.usda.gov/pubs_dbs.

REFERENCES

American Spice Trade Association: Inc., ASTA Cleanliness Specifications for Spices, Seeds, and Herbs, Revised April 28, 1999), 1999.

Bosland, P.W., Capsicums: Innovative uses of an ancient crop. P. 479-487. In: J.Janick (ed.), Progress in new crops. ASHS Press, Arlington, VA., 1996

Bosland, P.W., A.L. Bailey, and J.Iglesis-Olivas. *Capsicum* pepper varieties and classification. New Mexico State Univ. Ext. Cir.530, 1988

Bosland, P. W., Capsicum: A Comprehensive Bibliography, 3rd ed. The Chili Institute, New Mexico State University. Las Cruces, New Mexico, 1995

National Academy of Science, Food Chemical Codex, 5th ed., National Academy Press, Washington, DC 2003

The International Organization of Standardization; Paprika Specification ISO 7540, First edition. ISO, Switzerland, 1984

Woodbury, J.E., Determination of Capsicum pungency by high pressure liquid chromatography and spectrofluorometric detection, J. Assn. Office. Anal.Chem.63: 556-558, 1980

FDA Food Defect Action Levels http://vm.cfsan.fda.gov/~dms/dalbook.html

http://www.peppertrade.com/br/vernoticiaingles.php?idn=73

http://www.cardamomcityindia.com/chilli.thm

http://www.spizes.com/spiceonline/CategoryList/ChilliOleoresins.asp

http://my.execpc.com?~jwolf/spices2.html

http://www.krishiworld.com/html/condi_spices2.html

http://www.innspice.com/redpepper.htm

http://www.mccormick.com/content.cfm?id=8225

http://www.spice-box.com/mall/paprika.asp

http://www.astapsice.org/spice/spice.htm

http://www.deancoleman.com/herbs.htm

http://www.foodproductdesign.com/archive/1996/0596DE.html

http://www.kalsec.com/products/capsicum_adv.cfm

http://www.latcom.co.za/paprika_withheld.htm

http://www.fiery-foods.com/dave/pressure.html

http://ww.cahe.nmsu.edu/news/2002/2.4.02_garnet.html

http://www.chiliepepperinstitute.org.html

Nutritional Composition: http://www.nal.usda.gov/fnic/foodcomp/ or http://www.nal.usda.gov/pubs_dbs

Import statistics: http://www.fas.usda.gov/ustrade

Canadian Spice Regulations – "Standards"
Chemical: http://laws.justice.gc.ca/en/f-27/c.r.c.-c.870/124272.html
Sanitary-Insect Fragments: http://www.hc-sc.gc.ca/food-aliment/mh-dm/mhe-dme/compendium/volume_1/e_EmoE01.html

European Regulations (Portal to EU Law-use search feature):
http://www.europa.eu.int/eur-lex/en/

Monograph Cover: American Spice Association, Inc., Botanical Art, Sets 1-5.

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Food and Drug Administration
Washington DC 20204

SEP 15 1997

Winston A. Boyd, Ph.D.
Color Craft Consulting
4913 North Idlewild Avenue
Whitefish Bay, Wisconsin 53217

Dear Dr. Boyd:

This is in follow up to your facsimile of June 25, 1997 and our conversation of July 10, 1997, regarding the appropriate labeling of a food ingredient made from paprika. We regret the delay in responding, but trust that the following is helpful.

You specifically requested guidance on use of the terms "defatted paprika," or "defatted paprika meal" for an ingredient that is prepared from dried paprika peppers. As discussed in your fax, the dried peppers are deseeded, crushed and shredded. The shredded paprika is then further reduced in size to form a course paprika meal. The paprika meal is pressed and washed with hexane to remove the flavor and color components. The hexane washes are recovered and processed to produce paprika oleoresin. The washed paprika meal, is treated to remove residual solvent. The only difference between the washed or "spent" paprika meal and the original paprika meal is that the hexane-soluble components have been washed away. The materials removed from the paprika meal by the hexane wash are lipophilic (fat-like) in nature. Consequently, according to your fax, the only change in the washed paprika meal as compared to the original paprika meal is that the fat has been removed.

As we discussed in our conversation of July 10, 1997, the agency would not object to the use of the terms "defatted paprika," or "defatted paprika meal" for the above described ingredient. Should you have any further questions on this issue, please feel free to contact us.

Sincerely yours,

Felicia B. Satchell

Felicia B. Satchell
Chief
Food Standards Branch
Division of Programs
and Enforcement Policy
Office of Food Labeling

May 8, 1998

Mr. Richard O. Wood
Burditt & Radzius
333 W. Wacker Drive, 26th Floor
Chicago, IL 60606-1218

Dear Mr. Wood:

This is in response to your fax of April 2, 1998, concerning your client's inquiry regarding the legal status of the use of defatted paprika as a color additive diluent.

Based on the discussion we had during our meeting on March 31, 1998, and the information provided in your fax, we understand that paprika powder (listed as a color additive in § 73.340) is usually mixed with a diluent to lower its color value before it is sold to food manufacturers. We also understand that paprika oleoresin (listed as a color additive in § 73.345) is extracted from ground paprika with hexane as provided for under § 73.345(a)(1). The paprika material remaining after the extraction may be treated to lower its hexane concentration to less than 25 ppm. Your client has named this material "defatted paprika."

You have informed us that your client considers defatted paprika to be GRAS and intends to use it as a diluent to lower the color value of paprika powder. Paprika and paprika oleoresin are listed as GRAS in § 182.10 and 182.20, respectively. FDA has not listed defatted paprika as GRAS. Under § 73.1(a) substances that are GRAS under the conditions set forth in section 201(s) of the Federal Food, Drug, and Cosmetic Act may be used as diluents in color additive mixtures for food use. Section 201(s) of the Act does not limit GRAS determinations to FDA, but provides that general recognition of safety be done by experts qualified by training and experience to evaluate the safety of food ingredients.

We would like to remind you that while we recognize the right of manufacturers to make independent GRAS determinations, we reserve the authority to take appropriate regulatory action should we determine that the intended use of defatted paprika is not GRAS.

For your information, we are enclosing a copy of our proposed rule concerning GRAS substances in case you decide to submit a GRAS notification for defatted paprika.

Sincerely yours,

Aydin Örstan,
Division of Petition Control, HFS-215
Center for Food Safety
and Applied Nutrition

Enclosure