

UNITED STATES DEPARTMENT OF HEALTH AND HUMAN SERVICES
FOOD AND DRUG ADMINISTRATION

Citizen Petition to

Andrew C. von Eschenbach, M.D.,
Commissioner of Food and Drugs

Docket No.

For Review of **Codex Alimentarius**
Standard for Honey, Pursuant to 21 CFR 130.6

Submitted by the

American Beekeeping Federation, Inc.
American Honey Producers Association Inc.
National Honey Packers and Dealers Association
Sioux Honey Association
Western States Honey Packers and Dealers Association

March 3, 2006

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I. Introduction

The U.S. Food and Drug Administration (“FDA”) and other U.S. interests participate in the development of international standards by the Codex Alimentarius Commission, an international organization formed in 1962 to facilitate world trade. In 2001, the Revised Codex Standard for Honey was adopted by the 24th Session of the Codex Alimentarius Commission. The United States participated fully in the proceedings. While honey is produced in the U.S., traded internationally and consumed both as a packaged food and as a food ingredient, there currently is no standard of identity for honey in U.S. law.

Petitioners are trade associations (a description of each association petitioner is attached as Exhibit “A”) whose members are engaged in the businesses of production, importing, exporting, packaging and marketing of honey to both consumers as finished product and to manufacturers, who use honey as an ingredient in other foods. Petitioners seek a U.S. standard for honey based upon the 2001 Revised Codex Standard for Honey and invoke the review procedure set forth in 21 CFR 130.6. With the adoption of such requested standard, Petitioners expect that consumers and industry alike will accrue the presumed benefits of the international standard, and hopefully, the identity and traditional composition of honey will be preserved in a market of many new liquid sweeteners.

Although FDA has much experience in promulgating standards of identity, there is less specific experience and guidance in promulgating Codex standards into U.S. law. Petitioners are mindful of the process outlined in 21 CFR 130.5 for adoption of standards of identity and the possible applicability of FDA’s proposed amendments to 21 CFR 130.5 to the separate 21 CFR 130.6 process for review of Codex standards. A discussion of these issues is covered below in Part IV of this petition.

Finally, by way of introduction, a description of how honey is produced and a brief description of the U.S. honey industry is attached as Exhibit “B”.¹

II. Action Requested

This petition requests action by the Commissioner pursuant to 21 CFR 130.6 to adopt certain provisions of the Codex Standard for Honey (*CODEX STAN 12-1981, Rev.2 (2001)*), pursuant to 401 of the Federal Food Drug and Cosmetic Act. A copy of the Codex Standard for Honey with requested deviations is attached hereto as Exhibit “C.” Petitioners request the Commissioner to publish this Petition in the Federal Register as a proposal.

III. Reasons for Deviations

Petitioners request certain deviations from the Codex Standard for Honey. Referring to Exhibit C, the reasons for the deviations requested are as follows:

1. USITC Publication 3369, November 2000

1. Scope.

Delete the Voluntary Annex to the Standard because it is for commercial use only and not for application by Governments.

Delete from the scope the proposed separate standard in Part Two for honey for industrial uses since this standard has not been completed and this variation can be consolidated into the single standard for honey. The need for reference to two separate parts will thus no longer be necessary.

3. Essential Composition and Quality Factors

Section 3.4 Moisture Content

Delete subsections (a) and (b) replace the section with revised text that provides that no honey should have a moisture content exceeding 23% (or less than 77% dissolved soluble solids.) This moisture level is consistent with current U.S. honey and commercial practices and will preserve the integrity, quality and value that U.S. consumers expect in honey. U.S.D.A. Grade standards for extracted honey currently provide stricter moisture content requirements for grades of honey than the maximum moisture content proposed herein.

4. Contaminants; 4.1 Heavy Metals and 4.2 Residues of Pesticides and Veterinary Drugs:

Delete Section 4.0. Contaminants and Maximum levels for heavy metals and pesticide residues should be governed by U.S. law.

5. Hygiene

Delete Section 5. Hygiene requirements should be governed by U.S. law.

6. Labeling and 6.2 Labeling of Non-retail Containers

6. Delete reference to Codex General Standard for Labeling or Pre-Packaged Foods. The U.S. labeling laws applicable to foods in retail containers and non-retail containers should apply rather than the Codex General Standard for Labeling of Pre-Packaged Foods.

6.1.1. Standards of identity are referenced throughout FDA regulations and the existence of a standard of identity can trigger application of laws not otherwise applicable to non-standardized foods. Petitioners request a review of U.S. laws to ascertain whether the laws which otherwise apply to foods prescribed under a standard of identity, (e.g. 21 CFR Part 130, labeling, adulteration, misbranding etc.), would also apply to the Honey Codex regulation if adopted into law. For example, Petitioners desire that foods which do not conform to the Honey Codex Standard (by virtue of added ingredients or modifications) be required to be distinguished from "Honey" through non-misleading common or usual name labeling, as would be the case for a food with a standard of identity. If FDA determines that any laws would not apply to the requested Honey standard simply because of the possible

designation of the standard as a “Codex standard” rather than as a standard of identity, we suggest that the issue be addressed in the text of the standard. See example of language in brackets.

6.1.11(c) provides that honey “style” may be designated according to the method of removal of the comb. According to the Codex honey standard in subparagraph 6.1.11(c), honey containing one or more pieces of comb may be designated as “cut comb in honey” or “chunk honey.” In the United States, the designation for such honey most commonly used is “honey with comb.” Petitioners seek FDA clarification that the designation “honey with comb” will remain lawful if the Codex text is adopted, or in the alternative, FDA should add the style designation “honey with comb” to the list of allowed style designations.

Delete 6.1.12. As filtration with some concomitant removal of pollen is the commercial norm for honey manufactured in the U.S. , such honey should not be required to be specifically designated as “filtered.”

7. Methods of Sampling and Analysis

Delete entire Section 7.0. The U.S. government and regulatory authorities should enforce the standard using any methods deemed advisable and lawful.

ANNEX

Delete Annex. As the text in the annex is intended for voluntary application by commercial partners and not for application by governments, the Annex, in its entirety, should not be codified into U.S. law and should be deleted in its entirety.

IV. Statement of How the Proposed Standard Conforms to General Principles Outlined in Proposed Rules to 21 CFR Part 130.5; 70 F.R.29234 (May 20, 2005)

FDA has recently published proposed amendments to 21 CFR 130.5 at 70 F.R. 29234 prescribing approximately thirteen general principles governing the adoption of food standards. These proposed amendments may not technically apply to a petition for review of Codex standards under 21 CFR 130.6, however they merit comment in this Petition. When promulgating commodity standards, the Codex Alimentarius Commission applies many of the same general principles as those listed by FDA in the proposed rules published May 20, 2005. Petitioners respectfully submit that the Codex Alimentarius Honey Standard should be *ipso facto* proof of conformity to such similar general principles since conformity would be inherent in the Codex process. For this reason, we will not go into separate proof of adherence to each of the thirteen separate general principles in this petition. A comprehensive statement showing compliance with each of FDA’s thirteen proposed general principals will be provided by supplement if FDA feels this information is required or advisable. In lieu of such a lengthy discussion, a few key points relative to two of the proposed general principles are as follows:

The first, and presumably the most important proposed general principle for agency consideration in the adoption of a food standard is consideration of whether the requested standard promotes honesty and fair dealing in the interest of consumers.

A consumer study conducted in 2005 for the National Honey Board suggests that U.S. consumers are very confused about what “honey” means in terms of the food’s composition.² Forty-two percent of those interviewed believed that pure honey contains additives and 17% of those interviewed believed “honey” contains added syrup. With a variety of blended sweeteners and “honey pretenders” being introduced into the market, consumer understanding of the meaning of the term “honey” is likely to continue to erode. Thus, the codification of the identity statement “honey” is timely and sorely needed. The standard will preserve the food name of “honey” for the traditional food and clearly encourage the industry to promote the consumption of honey for its sensory and nutritive benefits that extend beyond its obvious role in the American diet as a natural sweetener.

Petitioners submit that the proposed standard will promote honesty and fair dealing not only in the interest of consumers, but in the interest of the honey industry as well. Petitioners particularly believe that a compositional standard for honey will serve as a tool to help combat the economic adulteration of honey.

According to a study of the impacts of economic adulteration on the U.S. honey industry, it was found that any significant level of adulteration would have the affect of expanding supply. For high value product like honey, absent a demand shift in the amount purchased at any given price, an increase in supply due to adulteration would result in downward price pressure and decreased producer revenue.³ Petitioners believe that to the extent that a clear honey standard would aid enforcement and industry compliance, reduced economic adulteration will benefit both consumers and producers.

Also, the proposed standard is expected to promote honesty and fair dealing within the food trade in general, where pure honey is used as an ingredient in other foods. A consumer study shows that consumers will pay more for foods made with real honey and highly value honey as an ingredient in foods.⁴

In regard to a second proposed general principle, the proposed food standard should take into account any other of FDA’s relevant regulations. Please note that the requested Codex Honey standard takes into account FDA’s other regulations by striking Codex language, which, otherwise might contravene FDA’s regulations regarding labeling, hygiene, contaminants and analytical methods and suggests application of U.S. law.

² Topline Results, Honey Label Confusion Study; November 1, 2005; National Honey Board.

³ Fairchild, Gary F., John P. Nichols and Oral Capps Jr. *Journal of Food Distribution Research* Vol. 34 (2, 2003): 38-45” Observations on Economic Adulteration On High Value Food Products: the Honey Case”

⁴ Honey Value Added Study for National Honey Board; March 2004; Jeffrey B. Gross

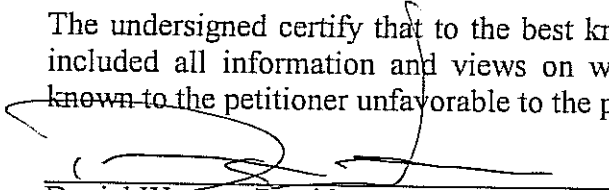
V. Statement of Meetings with Other Interest Groups


In formulating this petition, the Petitioners and other interest groups have conducted the following meetings, where the need for this action was either discussed or the petition itself discussed. These meetings do not include the numerous meetings where the honey industry participated in the extensive underlying Codex Alimentarius process to adopt the Revised Codex Honey Standard.


- Honey Industry Roundtable, December 2-3, 2004, San Antonio, TX; Sponsored by the National Honey Board
- The American Honey Producers Association, Inc., Annual Meeting, January 8, 2005, San Antonio, TX
- The National Honey Packers & Dealers Association, Annual Meeting January 6, 2005; Executive Committee meeting September 27, 2005
- American Beekeeping Federation, Inc. at Board of Directors meetings held June 6, 2004; July 22, 2004 and January 13, 2005
- Sioux Honey Association meeting held January 19, 2006
- Western States Honey Packers and Dealers Association meeting held January 5, 2006

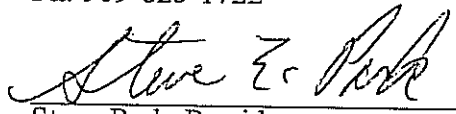
VI. Certification

The undersigned certify that to the best knowledge and belief of the undersigned, this Petition included all information and views on which the petition relies and it includes information known to the petitioner unfavorable to the petition.


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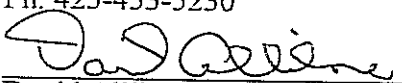

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Exhibit A

The American Beekeeping Federation

The American Beekeeping Federation (“ABF”) was established in 1943. ABF is a nationwide trade association composed of beekeepers, honey processors, bee supply manufacturers and dealers, and other interested parties. ABF has approximately 1200 members from across the United States. ABF beekeeper members range from hobbyists to multi-state commercial beekeepers operating tens of thousands of colonies. ABF members are involved in honey production, pollination, bee breeding and all other aspects of beekeeping.

The American Honey Producers Association, Inc.

The American Honey Producers Association , Inc. (“AHPA”) was organized in 1969. Its membership is limited to honey producers of any size but its approximately 1000 members are basically commercial, those with 500 or more colonies of bees. The APHA membership comes from 48 states, plus Canada and Argentina.

National Honey Packers and Dealers Association

National Honey Packers and Dealers Association exists primarily to serve the interests of packers of honey and interests of U.S. importers of honey insofar as they promote the interests of U.S. packers and the U.S. honey industry. It provides services to international members insofar as they promote the interests of the U.S. honey industry.

Sioux Honey Association

Sioux Honey Association is a member owned marketing cooperative founded in 1921 by five beekeepers who lived near Sioux City, Iowa, by pooling together \$200.00 and 3,000 pounds of honey as an experimental marketing project. Sioux Honey Association was created to further the economic interests of its member patrons through a sound marketing program. The cooperative marketing organization has grown into an international success in the honey industry. At present time, the Association has 309 members from 24 States, Canada and Mexico, that market their honey worldwide through the Association. The Association has plants in Sioux City, Iowa, Anaheim, California and Waycross, Georgia, with 82 employees. The Association annually markets approximately 15 percent of the total honey sold in the United States.

Western States Honey Packers & Dealers Association

The Western States Honey Packers & Dealers Association (“WSHPDA”) was established in 1985. The WSPDA is comprised of US honey packers and dealers (importers & exporters) that are headquartered and located west of the Mississippi River. The members, both packers and dealers, must either pack or import/export a minimum of 500,000 pounds of honey on an annual basis.

Exhibit B

Excerpted From USITC Publication 3369 – November 2000

Honey

Honey is a sweet viscous fluid derived from the nectar of flowers and produced in the honey sac of bees. Honey is an invert sugar, composed mainly of simple sugars (i.e., fructose and glucose) and water. Fructose and glucose comprise approximately 70 percent of the content of honey while water comprises about 17 percent. The remaining components of honey are maltose, sucrose, and other complex carbohydrates. Also, honey contains essential vitamins (e.g., vitamin B6, thiamin, niacin, riboflavin, and pantothenic acid), minerals (e.g., calcium, copper, iron, zinc, and magnesium), several different amino acids, and several antioxidant compounds (e.g., vitamin C and chrysin). Honey is classified by its individual characteristics (e.g., floral source, color, season, physical state, and means of preparation). There are over 300 unique varieties of honey that are produced in the United States. Honey differs in flavor and color depending upon the floral source from which the nectar is extracted by the honey bee. Honey may be classified as mono floral (from a single botanical source) or polyfloral (from multiple botanical sources, with no single predominant floral source). Monofloral honey may be classified by the specific blossom-type from which the nectar is extracted (e.g., blueberry honey made from nectar obtained from blueberry blossoms). Often, specialty monofloral honeys sell at a premium price. Polyfloral honey, having been derived from a mixture of many floral nectars, is generally classified by the time of year it is harvested rather than by floral sources (e.g., "spring honey" or "autumn honey"); however, polyfloral honey may also be classified by the area from which the nectar was sourced such as "desert honey" or "mountain honey." The floral source grants honey its distinctive flavor (e.g., star thistle, orange blossom, sage, and clover) and its distinctive color (e.g., "water white" or "dark amber"). Generally, lighter colored honeys possess a more mild flavor (e.g., clover honey), while darker colored honeys possess a stronger flavor (e.g., buckwheat honey). Honey is valued on the basis of floral source and color, and in most countries, the light-colored and milder tasting honeys are considered to be more valuable. While many varieties of honey exist on the market, most honey is blended to achieve a desired color and flavor as well as to provide a uniform product throughout a given market, most natural honey produced in the United States is marketed in liquid form, which is honey that is extracted from the comb by centrifugal force, gravity, or straining. Natural honey is also marketed as cream honey (also called "creamed," "whipped," or "spun"), which consists of pure honey in which dextrose crystallization has been encouraged; comb honey, which is honey marketed in the beeswax comb, both of which are edible; cut comb honey, which is liquid honey that has been packaged with chunks of honey comb; and dry honey (also know as "dried" or "powdered"), which is made by removing the water found in liquid honey by drum- or spray-drying. One of the most widely functional sweeteners, honey appears in a variety of products such as beers, breads and other baked goods, cereals, condiments, candies, medicines, and even shampoos. Honey also embodies mild antiseptic properties and has been used in the treatment of minor skin injuries such as burns and lacerations.

Production Process

Honey is produced in a beehive by a colony of honey bees. There are four traditional species of honey bees found in the world: (1) *Apis dorsata*, commonly known as the giant honey bee; (2)

Apis florea, or little honey bee; (3) *Apis cerana*, or Eastern honey bee; and (4) *Apis mellifera*, or Western honey bee. In the United States, *A. mellifera* is the feral bee as well as the bee used in commercial production. A typical colony of commercial honey bees in the United States contains one queen, 500 to 1,000 drones (male bees without stingers whose single purpose is to mate with the queen), and approximately 40,000 to 60,000 workers (female bees that perform the work of the colony, including cleaning the nursery, caring for larvae, collecting nectar, making wax, and guarding and cooling the hive). The beehive is a series of combs composed of hexagonal cells that are made of wax produced in the stomach of the worker bees. The wax cells are used for storage. The worker bees naturally construct a core nest where the brood are stored and then the bees create a layer of insulation above the nest consisting of pollen and honey.

"Feral" bees are not maintained by beekeepers (i.e., they are wild bees). The feral bee population in the United States is threatened by the so-called "Africanized" bee, which first made an appearance in the United States in Texas in October 1990. Since that time, Africanized swarms have been found further in Texas, Arizona, California, New Mexico, and Nevada. Africanized bees have been spreading their range since 1957, when some African queens (*Apis mellifera scutellata*) escaped from a breeding experiment in Brazil and mated with the more docile European bees already introduced to the Americas. The implication of the invasion of the United States by the Africanized bee is that breeding between the Africanized bees and the native bees generally produces Africanized swarms. Africanized swarms of bees have received a great deal of publicity because of their highly aggressive behavior coupled with some reports that these bees produce less honey than the native bees.

The production of honey begins with the bees gathering nectar from various plants. Nectar is a solution composed of sugars in water with such additional constituents as proteins, amino acids, organic acids, and antioxidants. Bees may forage for several miles from their hive to find nectar. A bee may make several trips for nectar per day, permitting the weather is favorable. Upon returning to the hive, the bee regurgitates the nectar into the mouth of a specialized "house" bee. The house bee adds enzymes and places the unripe honey into the hexagonal cells of the comb. The unripe honey is often spread among several cells to help in moisture evaporation, which the house bees promote by fanning their wings. Cells are then capped with a thin layer of wax, and the honey is allowed to ripen.

U.S. Beekeeper Operations

Beekeepers are often migratory, moving their hives to follow the nectar and bloom flow, as well as to areas in need of bees' pollination services or areas rich in certain flora to promote production of a distinct type of honey. In the United States, it is estimated that approximately 69 percent of all colonies are on the road each year to pollinate crops and to produce honey and beeswax. The migration is generally from north in the summer to south in the winter, as well as to California during almond season and several other states for pollination of crops such as melons. Almonds, apples, and melons employed 61 percent of the total bee colonies rented for pollination services in 1999. Beekeepers in the United States keep their bees in constructed wooden hives that are relatively easy to transport. Hives are often placed on wooden pallets for ease of handling by forklifts. The bees live in the core nest and store the honey, intended to serve as food for the colony, in the wooden frames above, which are known as "supers." To prevent the queen from laying brood in the supers containing the honey, beekeepers place an "excluder"

between the lower core nest and the supers above. Worker bees produce more honey than required for use by the colony, and so the excess poundage of honey can be harvested from the supers by beekeepers. Honey is harvested by first driving the bees out of the super down into the core nest via smoke, chemicals, or low pressure air. Then, the wooden frames contained in the super are removed from the hive. The frames are removed when the cells are fully capped with wax, which ensures that the honey is fully ripened and void of excess water. After removal of the frames, almost all honey is extracted from the combs, but some remains in the form of "comb" or "chunk" honey. The liquid honey is exposed by "uncapping" the combs — removing the wax capping that covers the honeycomb frames. Combs are uncapped by using either hot knives or power uncappers. The wax from caps is rendered for the production of beeswax foundation and the sale of beeswax for candles and other uses. Any remaining honey left in the caps is separated via centrifugal force by a wax spinner or mechanically squeezed out by a cap compressing system. Separation of honey from the uncapped cells is done by an "extractor" (a centrifuge). The uncapped frames are placed in the extractor where the honey is spun out of the comb. As honey flows from the extractor, it contains particles of wax, bees, and other hive matter. Thus, the honey may be run through a simple netting (usually nylon) or a more complicated high-pressure filter before it is drained into a storage tank (sump). Even though some processing has occurred at this point, the honey is still considered "raw" or "unprocessed." The honey is then either placed in large drums and transported to an independent packer for further processing; further processed by the producer/packer (the beekeeper) and bottled for local sale; or left in its raw form and bottled by the producer/packer (the beekeeper) for local sale.

U.S. Packer Operations

Upon receipt of extracted honey, the packer (as well as the beekeepers with packing facilities) may blend different types of honey, both domestic and foreign, to obtain a uniform product. The honeys, usually in 55-gallon drums from the beekeepers, are labeled by the packers according to color and floral source of the honey, making selection for blending or production of mono floral honey (e.g., "orange") possible. At this point, heat may or may not be used to pack a finished product. Heating honey aids in the flow of honey through the processing facility and can retard granulation and spoilage, largely through the destruction of yeasts naturally present in honey. Honey that has been heated is acceptable to most users in the United States, although in other areas of the world, honey that has been heated is perceived to have lost some of its health and nutritional benefits. Because both diastase, an enzyme that destroys starch, and hydroxymethylfurfural (HMF), a by-product of the decomposition of sugars in acid, are affected by heat, countries preferring unheated honey often have required levels of each for imports. "Flash heating," whereby the honey is rapidly heated to 120 degrees or above and then quickly cooled, can produce honey with acceptable HMF and diastase levels for export to many countries, while maintaining its favorable processing characteristics.

Honey may also be stored for years under proper storage conditions (i.e., in a dry place at approximately 70 degrees F, or alternatively at freezing temperatures). According to the USDA, honey stored for years at freezer temperatures, 0 to -10 degrees F, cannot be distinguished from fresh, newly-extracted honey in color, flavor, or aroma.

Heated honey next flows through filtering mechanisms (filtering paper sheets in commercial processing plants), usually under high pressure. Some packing facilities also add diatomaceous

earth to the honey before filtering to aid in filtration. The honey next moves to a "settling tank" in a warm area for several hours or even days, with any remaining foreign material floating to the top, where it can be skimmed. Honey then can be poured directly into containers and sold to consumers or industrial users. Creamed honey is another honey product that the packer may also process. This is honey in which the natural granulation has been encouraged and controlled for a smooth consistency similar to that of butter. Although nearly all honey can be creamed, those honeys higher in glucose generally granulate the fastest. To start the production of creamed honey, extracted honey is heated to destroy the natural yeasts that can cause fermentation and to dissolve large glucose crystals. The heated honey is strained to remove any extraneous substances such as wax, pollen, or bee debris. The honey is then cooled and "starter" seed, consisting of creamed honey that has been finely ground to create extremely fine glucose crystals, is added. The starter is completely blended into the honey to be creamed in order to assure uniform crystallization. After blending, the mixture of seed and honey is allowed to set for a period of time during which air bubbles rise to the surface and are skimmed. The product is then transferred to containers and sets up within 4 to 6 days when stored at approximately 57 degrees Fahrenheit. Packers rarely pack products other than honey on the same equipment and machinery or using the same production and related workers employed to pack honey

Interchangeability and Customer and Producer Perceptions

There is no substitute for honey and honey's unique taste, viscosity, and perceived health benefits make it very different from other sweeteners.

Honey is used as a spread on toast, biscuits, and pancakes; as a glaze on ham; in baked goods; and as an ingredient in homemade barbeque sauces and dressings, to name a few uses. Approximately 46 percent of the consumers in a recent survey conducted for the NHB claimed that there was no substitute for honey. Consumers purchase honey for several reasons. While some consumers purchase honey for table use for its perceived nutritional and health benefits, others use honey primarily as a sweetener and therefore consider factors such as flavor and price when deciding among these products. Price is also a factor in the industrial market, in which sugar, HFCS, invert sugar, fruit juice, and non-caloric sweeteners are the main alternative sweeteners for industrial use. When flavor is not important, HFCS may be substitutable for honey, in that HFCS has a high level of sweetness resulting from the fructose level, hygroscopic abilities, and viscosity and emulsion stability sought in products such as salad dressings and other sauces.

Channels of Distribution

Four types of firms handle honey: producer-packers, cooperative marketing organizations, independent packers (bottlers), and brokers. To "handle" honey means, "[T]o process, package, sell, transport, purchase, or in any other way, place honey or honey products, or cause them to be placed, in the current of commerce." [7 CFR, Part 1240.8 - Honey Research, Promotion, and Consumer Information Order] This does not include the transportation of unprocessed honey from a producer to a handler (e.g., a processor or marketer) or transportation by a commercial carrier of honey. Producer-packers are beekeepers that process, pack, and market their own honey. Often their product is marketed unconventionally-from home, on the Internet, door-to-door, at roadside stands, and at farmer's markets. In some instances, beekeepers may rely on brokers or dealers to sell their honey. Beekeepers may also be members of cooperatives that

process, pack, and market honey. Cooperative marketing organizations pool individual members' honey and often imported honey, and then process, pack, and market the honey under the cooperative label and private labels in both bulk and retail containers. Sioux Honey Association is the only large-scale cooperative operating in the United States. Independent packers process, pack, and market both domestic and imported honey in both bulk and retail containers. On the retail level, independent packers often market consumer-recognized brands of honey and provide services such as private packing and labeling for retail outfits. Brokers buy and sell honey from domestic and international sources and serve as an agent for independent packers. The users of honey are manufacturers and druggists; bakers and confectioners; food processors; tobacco processors; and households that obtain the product from wholesale grocers, chain and retail stores, the Internet, and local outlets such as farmers' markets, roadside stands, and local restaurants. According to the National Honey Board, the U.S. honey market consists of three market sectors: retail, industrial (bulk), and food service. Almost all food retail stores (i.e., chain stores and supermarkets) market honey.

The latest survey of consumer uses and attitudes toward honey conducted for the NHB reported that 86 percent of all retail honey was purchased at grocery stores in 1997. The same survey shows that retail consumers prefer lighter honeys. Data published by the NHB indicate that in 1999, the majority of U.S. honey consumption -- 47 percent -- was marketed in bulk form to the industrial sector, while the retail sector accounted for 39 percent of total U.S. honey consumption and the food service sector accounted for 14 percent of total U.S. honey consumption.

The USITC cited two NHB studies:

- Consumer Use and Attitudes Toward Honey, Report prepared for the NHB, 1997.
- Industrial Use and Attitudes Study, NHB, 1992.

Exhibit C

STANDARD FOR HONEY

CODEX STAN 12-1981, Rev.1 (1987), Rev.2 (2001)

~~The Annex to this Standard is intended for voluntary application by commercial partners and not for application by Governments.~~

1. SCOPE

~~Part One of this~~ This Standard applies to all honeys produced by honey bees and covers all styles of honey presentations which are processed and ultimately intended for direct consumption and to all honeys packed, processed or intended for sale in bulk containers as honey, which may be repacked for retail sale, or for sale or use as an ingredient in other foods. ~~Part Two covers honey for industrial uses or as an ingredient in other foods.~~

~~1.2 Parts Two of this Standard also covers honey which is packed for sale in bulk containers, which may be re-packed into retail packs.~~

~~Part One~~

2. DESCRIPTION

2.1 DEFINITION

Honey is the natural sweet substance produced by honey bees from the nectar of plants or from secretions of living parts of plants or excretions of plant sucking insects on the living parts of plants, which the bees collect, transform by combining with specific substances of their own, deposit, dehydrate, store and leave in the honey comb to ripen and mature.

2.1.1 Blossom Honey or Nectar Honey is the honey which comes from nectars of plants.

2.1.2 Honeydew Honey is the honey which comes mainly from excretions of plant sucking insects (*Hemiptera*) on the living parts of plants or secretions of living parts of plants.

2.2 DESCRIPTION

Honey consists essentially of different sugars, predominantly fructose and glucose as well as other substances such as organic acids, enzymes and solid particles derived from honey collection. The colour of honey varies from nearly colourless to dark brown. The consistency can be fluid, viscous or partly to entirely crystallised. The flavour and aroma vary, but are derived from the plant origin.

3. ESSENTIAL COMPOSITION AND QUALITY FACTORS

3.1 Honey sold as such shall not have added to it any food ingredient, including food additives, nor shall any other additions be made other than honey. Honey shall not have any objectionable matter, flavour, aroma, or taint absorbed from foreign matter during its processing and storage. The honey

shall not have begun to ferment or effervesce. No pollen or constituent particular to honey may be removed except where this is unavoidable in the removal of foreign inorganic or organic matter.

3.2 Honey shall not be heated or processed to such an extent that its essential composition is changed and/ or its quality is impaired.

3.3 Chemical or biochemical treatments shall not be used to influence honey crystallisation.

3.4 MOISTURE CONTENT

(a) ~~Honeys not listed below not more than 20%.~~

(b) ~~Heather Honey (*Calluna*) not more than 23%.~~

No water may be added to honey in the course of extraction or packing for sale or resale as honey.

Honey shall not have a moisture content exceeding 23%.

3.5 SUGARS CONTENT

3.5.1 FRUCTOSE AND GLUCOSE CONTENT (SUM OF BOTH)

(a) Honey not listed below - not less than 60 g/100g

(b) Honeydew honey,

blends of honeydew honey with blossom honey - not less than 45 g/100g

3.5.2 SUCROSE CONTENT

(a) Honey not listed below - not more than 5 g/100g

(b) Alfalfa (*Medicago sativa*), Citrus spp., False Acacia (*Robinia pseudoacacia*), French Honeysuckle (*Hedysarum*), Menzies Banksia (*Banksia menziesii*), Red Gum (*Eucalyptus camaldulensis*), Leatherwood (*Eucryphia lucida*), *Eucryphia milligani* - not more than 10 g/100g

(c) Lavender (*Lavandula spp*), Borage (*Borago officinalis*) - not more than 15 g/100g

3.6 WATER INSOLUBLE SOLIDS CONTENT

(a) Honeys other than pressed honey - not more than 0.1 g/100g

(b) Pressed honey - not more than 0.5 g/100g

4. ~~CONTAMINANTS~~

4.1 ~~HEAVY METALS~~

~~Honey shall be free from heavy metals in amounts which may represent a hazard to human health. The products covered by this Standard shall comply with those maximum levels for heavy metals established by the Codex Alimentarius Commission.~~

4.2 ~~RESIDUES OF PESTICIDES AND VETERINARY DRUGS~~

~~The products covered by this standard shall comply with those relevant maximum residue limits for honey established by the Codex Alimentarius Commission.~~

5. HYGIENE

~~5.1 It is recommended that the products covered by the provisions of this standard be prepared and handled in accordance with the appropriate sections of the Recommended International Code of Practice — General Principles of Food Hygiene recommended by the Codex Alimentarius Commission (CAC/RCP 1 1969, Rev 3 1997), and other relevant Codex texts such as Codes of Hygienic Practice and Codes of Practice.~~

~~5.2 The products should comply with any microbiological criteria established in accordance with the Principles for the Establishment and Application of Microbiological Criteria for Foods (CAC/GL 21-1997).~~

6. LABELLING

~~In addition to the provisions of the General Standard for the Labeling of Pre-packaged Foods (CODEX STAN 1 1985, Rev 2 1999), the following specific provisions apply:~~

6.1 THE NAME OF THE FOOD

6.1.1 Products conforming to ~~Part One~~ of the Standard shall be designated 'honey'. [Foods containing honey and any flavoring, spice or other added ingredient or if honey is processed in such a way that a modification to honey occurs that materially changes the flavor, texture, color, viscosity, and other material characteristics of pure honey, such foods shall be distinguished in the food name from honey by declaration of the ingredient or modification.]

6.1.2 For products described in 2.1.1 the name of the food may be supplemented by the term “blossom” or “nectar”.

6.1.3 For products described in 2.1.2 the word “honeydew” may be placed in close proximity to the name of the food.

6.1.4 For mixtures of the products described in 2.1.1 and 2.1.2 the name of the food may be supplemented with the words “a blend of honeydew honey with blossom honey”.

6.1.5 Honey may be designated by the name of the geographical or topographical region if the honey was produced exclusively within the area referred to in the designation.

6.1.6 Honey may be designated according to floral or plant source if it comes wholly or mainly from that particular source and has the organoleptic, physicochemical and microscopic properties corresponding with that origin.

6.1.7 Where honey has been designated according to floral or plant source (6.1.6) then the common name or the botanical name of the floral source shall be in close proximity to the word "honey".

6.1.8 Where honey has been designated according to floral, plant source, or by the name of a geographical or topological region, then the name of the country where the honey has been produced shall be declared.

6.1.9 The subsidiary designations listed in 6.1.10 may not be used unless the honey conforms to the appropriate description contained therein. The styles in 6.1.11 (b) and (c) shall be declared.

6.1.10 Honey may be designated according to the method of removal from the comb.

(a) Extracted Honey is honey obtained by centrifuging decapped broodless combs.

(b) Pressed Honey is honey obtained by pressing broodless combs.

(c) Drained Honey is honey obtained by draining decapped broodless combs.

6.1.11 Honey may be designated according to the following styles:

(a) Honey which is honey in liquid or crystalline state or a mixture of the two;

(b) Comb Honey which is honey stored by bees in the cells of freshly built broodless combs and which is sold in sealed whole combs or sections of such combs;

(c) Cut comb in honey, [honey with comb,] or chunk honey which is honey containing one or more pieces of comb honey.

~~6.1.12 Honey which has been filtered in such a way as to result in the significant removal of pollen shall be designated filtered honey.~~

~~6.2 LABELLING OF NON-RETAIL CONTAINERS~~

~~6.2.1 Information on labeling as specified in The General Standard for the Labeling of Prepackaged Foods and in Section 6.1 shall be given either on the container or in accompanying documents, except that the name of the product, lot identification and the name and address of the producer, processor or packer shall appear on the container.~~

~~7. METHODS OF SAMPLING AND ANALYSIS~~

~~The methods of sampling and analysis to be employed for the determination of the compositional and quality factors are detailed below:~~

~~7.1 SAMPLE PREPARATION~~

~~Samples should be prepared in accordance with AOAC 920.180.~~

~~7.2 DETERMINATION OF MOISTURE CONTENT~~

~~AOAC 969.38B / J. Assoc. Public Analysts (1992) 28 (4) 183-187 / MAFF Validated method V21 for moisture in honey.~~

~~7.3 DETERMINATION OF SUGARS CONTENT~~

~~7.3.1 FRUCTOSE AND GLUCOSE CONTENT (SUM OF BOTH)~~

~~Determination of sugars by HPLC — Harmonised Methods of the European Honey Commission, Apidologie — Special Issue 28, 1997, Chapter 1.7.2~~

~~7.3.2 SUCROSE CONTENT~~

~~Determination of sugars by HPLC — Harmonised Methods of the European Honey Commission, Apidologie — Special Issue 28, 1997, Chapter 1.7.2~~

~~7.4 DETERMINATION OF WATER-INSOLUBLE SOLIDS CONTENT~~

~~J. Assoc. Public Analysts (1992) 28 (4) 189-193/MAFF Validated method V22 for water-insoluble solids in honey~~

~~7.5 DETERMINATION OF ELECTRICAL CONDUCTIVITY~~

~~Determination of electrical conductivity — Harmonised Methods of the European Honey Commission, Apidologie — Special Issue 28, 1997, Chapter 1.2~~

~~7.6 DETERMINATION OF SUGARS ADDED TO HONEY (AUTHENTICITY)~~

~~AOAC 977.20 for sugar profile, AOAC 991.41 internal standard for SCIRA (stable carbon isotope ratio-analysis).~~

Annex- Deleted in its entirety

REVISED CODEX STANDARD FOR HONEY
CODEX STAN 12-1981, Rev.1 (1987), Rev.2 (2001)¹

The Annex to this Standard is intended for voluntary application by commercial partners and not for application by Governments.

1. SCOPE

- 1.1 Part One of this Standard applies to all honeys produced by honey bees and covers all styles of honey presentations which are processed and ultimately intended for direct consumption. Part Two covers honey for industrial uses or as an ingredient in other foods.
- 1.2 Parts Two of this Standard also covers honey which is packed for sale in bulk containers, which may be repacked into retail packs.

PART ONE

2. DESCRIPTION

2.1 DEFINITION

Honey is the natural sweet substance produced by honey bees from the nectar of plants or from secretions of living parts of plants or excretions of plant sucking insects on the living parts of plants, which the bees collect, transform by combining with specific substances of their own, deposit, dehydrate, store and leave in the honey comb to ripen and mature.

- 2.1.1 Blossom Honey or Nectar Honey is the honey which comes from nectars of plants.
- 2.1.2 Honeydew Honey is the honey which comes mainly from excretions of plant sucking insects (*Hemiptera*) on the living parts of plants or secretions of living parts of plants.

2.2 DESCRIPTION

Honey consists essentially of different sugars, predominantly fructose and glucose as well as other substances such as organic acids, enzymes and solid particles derived from honey collection. The colour of honey varies from nearly colourless to dark brown. The consistency can be fluid, viscous or partly to entirely crystallised. The flavour and aroma vary, but are derived from the plant origin.

3. ESSENTIAL COMPOSITION AND QUALITY FACTORS

- 3.1 Honey sold as such shall not have added to it any food ingredient, including food additives, nor shall any other additions be made other than honey. Honey shall not have any objectionable matter, flavour, aroma, or taint absorbed from foreign matter during its processing and storage. The honey shall not have begun to ferment or effervesce. No pollen or constituent particular to honey may be removed except where this is unavoidable in the removal of foreign inorganic or organic matter.
- 3.2 Honey shall not be heated or processed to such an extent that its essential composition is changed and/ or its quality is impaired
- 3.3 Chemical or biochemical treatments shall not be used to influence honey crystallisation.

¹ Secretariat Note: The Revised Codex Standard for Honey was adopted by the 24th Session of the Codex Alimentarius Commission in 2001. At the time of the adoption the Commission agreed that further work would be undertaken on certain technical issues, particularly the provisions concerning Moisture Content.

3.4 MOISTURE CONTENT

- (a) Honeys not listed below - not more than 20%
- (b) Heather honey (*Calluna*) - not more than 23%

3.5 SUGARS CONTENT**3.5.1 FRUCTOSE AND GLUCOSE CONTENT (SUM OF BOTH)**

- (a) Honey not listed below - not less than 60 g/100g
- (b) Honeydew honey, - not less than 45 g/100g
blends of honeydew honey with blossom honey

3.5.2 SUCROSE CONTENT

- (a) Honey not listed below - not more than 5 g/100g
- (b) Alfalfa (*Medicago sativa*), Citrus spp., False Acacia (*Robinia pseudoacacia*), French Honeysuckle (*Hedysarum*), Menzies Banksia (*Banksia menziesii*), Red Gum (*Eucalyptus camaldulensis*), Leatherwood (*Eucryphia lucida*), *Eucryphia milligani* - not more than 10 g/100g
- (c) Lavender (*Lavandula spp*), Borage (*Borago officinalis*) - not more than 15 g/100g

3.6 WATER INSOLUBLE SOLIDS CONTENT

- (a) Honeys other than pressed honey - not more than 0.1 g/100g
- (b) Pressed honey - not more than 0.5 g/100g

4. CONTAMINANTS**4.1 HEAVY METALS²**

Honey shall be free from heavy metals in amounts which may represent a hazard to human health. The products covered by this Standard shall comply with those maximum levels for heavy metals established by the Codex Alimentarius Commission.

4.2 RESIDUES OF PESTICIDES AND VETERINARY DRUGS

The products covered by this standard shall comply with those maximum residue limits for honey established by the Codex Alimentarius Commission.

5. HYGIENE

- 5.1 It is recommended that the products covered by the provisions of this standard be prepared and handled in accordance with the appropriate sections of the Recommended International Code of Practice - General Principles of Food Hygiene recommended by the Codex Alimentarius Commission (CAC/RCP 1-1969, Rev 3-1997), and other relevant Codex texts such as Codes of Hygienic Practice and Codes of Practice.
- 5.2 The products should comply with any microbiological criteria established in accordance with the Principles for the Establishment and Application of Microbiological Criteria for Foods (CAC/GL 21-1997).

² These levels will be established in consultation between the Codex Committee on Sugars and the Codex Committee on Food Additives and Contaminants as soon as possible.

6. LABELLING

In addition to the provisions of the General Standard for the Labelling of Pre-packaged Foods (CODEX STAN 1-1985, Rev 2-1999), the following specific provisions apply:

6.1 THE NAME OF THE FOOD

- 6.1.1 Products conforming to Part One of the Standard shall be designated 'honey'.
- 6.1.2 For products described in 2.1.1 the name of the food may be supplemented by the term "blossom" or "nectar".
- 6.1.3 For products described in 2.1.2 the word "honeydew" may be placed in close proximity to the name of the food.
- 6.1.4 For mixtures of the products described in 2.1.1 and 2.1.2 the name of the food may be supplemented with the words "a blend of honeydew honey with blossom honey".
- 6.1.5 Honey may be designated by the name of the geographical or topographical region if the honey was produced exclusively within the area referred to in the designation.
- 6.1.6 Honey may be designated according to floral or plant source if it comes wholly or mainly from that particular source and has the organoleptic, physicochemical and microscopic properties corresponding with that origin.
- 6.1.7 Where honey has been designated according to floral or plant source (6.1.6) then the common name or the botanical name of the floral source shall be in close proximity to the word "honey".
- 6.1.8 Where honey has been designated according to floral, plant source, or by the name of a geographical or topological region, then the name of the country where the honey has been produced shall be declared.
- 6.1.9 The subsidiary designations listed in 6.1.10 may not be used unless the honey conforms to the appropriate description contained therein. The styles in 6.1.11 (b) and (c) shall be declared.
- 6.1.10 Honey may be designated according to the method of removal from the comb.
 - (a) Extracted Honey is honey obtained by centrifuging decapped broodless combs.
 - (b) Pressed Honey is honey obtained by pressing broodless combs.
 - (c) Drained Honey is honey obtained by draining decapped broodless combs.
- 6.1.11 Honey may be designated according to the following styles:
 - (a) Honey which is honey in liquid or crystalline state or a mixture of the two;
 - (b) Comb Honey which is honey stored by bees in the cells of freshly built broodless combs and which is sold in sealed whole combs or sections of such combs;
 - (c) Cut comb in honey or chunk honey which is honey containing one or more pieces of comb honey.
- 6.1.12 Honey which has been filtered in such a way as to result in the significant removal of pollen shall be designated filtered honey.

6.2 LABELLING OF NON-RETAIL CONTAINERS

- 6.2.1 Information on labelling as specified in The General Standard for the Labelling of Pre-packaged Foods and in Section 6.1 shall be given either on the container or in accompanying documents, except that the name of the product, lot identification and the name and address of the producer, processor or packer shall appear on the container.

7. METHODS OF SAMPLING AND ANALYSIS

The methods of sampling and analysis to be employed for the determination of the compositional and quality factors are detailed below:

7.1 SAMPLE PREPARATION

Samples should be prepared in accordance with AOAC 920.180.

7.2 DETERMINATION OF MOISTURE CONTENT³

AOAC 969.38B / J. Assoc. Public Analysts (1992) 28 (4) 183-187 / MAFF Validated method V21 for moisture in honey.

7.3 DETERMINATION OF SUGARS CONTENT⁴

7.3.1 FRUCTOSE AND GLUCOSE CONTENT (SUM OF BOTH)

Determination of sugars by HPLC - Harmonised Methods of the European Honey Commission, Apidologie – Special Issue 28, 1997, Chapter 1.7.2

7.3.2 SUCROSE CONTENT

Determination of sugars by HPLC - Harmonised Methods of the European Honey Commission, Apidologie – Special Issue 28, 1997, Chapter 1.7.2

7.4 DETERMINATION OF WATER-INSOLUBLE SOLIDS CONTENT

J. Assoc. Public Analysts (1992) 28 (4) 189-193/ MAFF Validated method V22 for water insoluble solids in honey

7.5 DETERMINATION OF ELECTRICAL CONDUCTIVITY⁵

Determination of electrical conductivity - Harmonised Methods of the European Honey Commission, Apidologie – Special Issue 28, 1997, Chapter 1.2

7.6 DETERMINATION OF SUGARS ADDED TO HONEY (AUTHENTICITY)⁶

AOAC 977.20 for sugar profile,

AOAC 991.41 internal standard for SCIRA (stable carbon isotope ratio analysis).

³ These methods are identical

⁴ Subject to endorsement by CCMAS

⁵ Subject to endorsement by CCMAS

⁶ CCS noted that a screening method for the detection of cane sugar adulteration of honey was available.

ANNEX

This text is intended for voluntary application by commercial partners and not for application by governments.

1. ADDITIONAL COMPOSITION AND QUALITY FACTORS

Honey may have the following compositional and quality factors:

1.1 FREE ACIDITY

The free acidity of honey may be not more than 50 milliequivalents acid per 1000g.

1.2 DIASTASE ACTIVITY

The diastase activity of honey, determined after processing and/or blending, in general not less than 8 Schade units and in the case of honeys with a low natural enzyme content not less than 3 Schade Units.

1.3 HYDROXYMETHYLFURFURAL CONTENT

The hydroxymethylfurfural content of honey after processing and/or blending shall not be more than 40 mg/kg. However, in the case of honey of declared origin from countries or regions with tropical ambient temperatures, and blends of these honeys, the HMF content shall not be more than 80 mg/kg.

1.4 ELECTRICAL CONDUCTIVITY

- (a) honey not listed under (b) or (c), and blends of these honeys - not more than 0.8 mS/cm
- (b) Honeydew and chestnut honey and blends of these except with those listed under (c) - not less than 0.8 mS/cm
- (c) Exceptions : Strawberry tree (*Arbutus unedo*), Bell Heather (*Erica*), Eucalyptus, Lime (*Tilia spp*), Ling Heather (*Calluna vulgaris*) Manuka or Jelly bush (*Leptospermum*), Tea tree (*Melaleuca spp*).

2. METHODS OF SAMPLING AND ANALYSIS

The methods of sampling and analysis to be employed for the determination of the additional compositional and quality factors set out in Section 1 of this Annex are detailed below:

2.1 SAMPLE PREPARATION

The method of sample preparation is described in section 7.1 of the Standard. In the determination of diastase activity (2.2.2) and hydroxymethylfurfural content (2.2.3), samples are prepared without heating.

2.2 METHODS OF ANALYSIS

2.2.1 DETERMINATION OF ACIDITY

J. Assoc. Public Analysts (1992) 28 (4) 171-175 / MAFF validated method V19 for acidity in honey

2.2.2 DETERMINATION OF DIASTASE ACTIVITY

2.2.6.1 AOAC 958.09

or

Determination of diastase activity with Phadebas - Harmonised Methods of the European Honey Commission, Apidologie – Special Issue 28, 1997, Chapter 1.6.2

2.2.3 DETERMINATION OF HYDROXYMETHYLFURFURAL (HMF) CONTENT

AOAC 980.23

or

Determination of hydroxymethylfurfural by HPLC - Harmonised Methods of the European Honey Commission, Apidologie – Special Issue 28, 1997, Chapter 1.5.1

2.3. LITERATURE REFERENCES

Bogdanov S, Honigdiastase, Gegenüberstellung verschiedener Bestimmungsmethoden, *Mitt. Gebiete Lebensmitt. Hyg.* 75, 214-220 (1984)

Bogdanov S and Lischer P, Interlaboratory trial of the European Honey Commission: Phadebas and Schade Diastase determination methods, Humidity by refractometry and Invertase activity: Report for the participants 1993.

Chataway HD (1932) *Canad J Res* 6, 540; (1933) *Canad J Res* 8, 435; (1935) *Canad Bee J* 43, (8) 215.

DIN-NORM 10750 (July 1990): Bestimmung der Diastase-Aktivität.

DIN. Norm, Entwurf: Bestimmung des Gehaltes an Hydroxymethylfurfural: Photometrisches Verfahren nach Winkler (1990)

Determination of Diastase with Phadebas, *Swiss Food Manual*, Chapter 23A, Honey, Bern, 1995.

Figueiredo V, HMF Interlaboratory Trial, Report for the participants, Basel canton chemist laboratory, (1991)

Jeurings J and Koppers F, High Performance Liquid Chromatography of Furfural and Hydroxymethylfurfural in Spirits and Honey. *J. AOAC*, 1215 (1980).

Determination of Hydroxymethylfurfural by HPLC, *Swiss Food Manual*, Kapitel Honig, Eidg. Druck und Materialzentrale 1995

International Honey Commission Collaborative Trial (in press).

Hadorn H (1961) *Mitt Gebiete Lebens u Hyg*, 52, 67.

Kiermeier F, Koberlein W (1954) *Z Unters Lebensmitt*, 98, 329.

Lane JH and Eynon L (1923) *J Soc Chem Ind* 42, 32T, 143T, 463T.

Schade J. E., Marsh G. L. and Eckert J. E.: Diastase activity and hydroxymethylfurfural in honey and their usefulness in detecting heat adulteration *Food Research* 23, 446-463 (1958).

Siegenthaler U, Eine einfache und rasche Methode zur Bestimmung der α -Glucosidase (Saccharase) im Honig. *Mitt. Geb. Lebensmittelunters. Hyg.* 68, 251-258 (1977).

Turner JH, Rebers PA, Barrick PL and Cotton RH (1954) *Anal Chem*, 26, 898.

Walker HS (1917) *J Ind Eng Chem*, 2, 490.

Wedmore EB (1955), *Bee World*, 36, 197.

White JW Kushnir I and Subors MH (1964) *Food Technol*, 18, 555.

FW (1959) *JAOAC*, 42, 344.

White J, Spectrophotometric Method for Hydroxymethylfurfural in Honey. *J. AOAC*, 509 (1979).

Winkler O: Beitrag zum Nachweis und zur Bestimmung von Oxymethylfurfural in Honig und Kunsthonig. *Z. Lebensm. Forsch.* 102, 160-167 (1955)

Harmonised methods of the European Honey Commission, Apidologie - special issue, 28, 1997

NOTE: CCS asked CCMAS to consider retaining only those essential references.

PART TWO

[Honey for Industrial Uses or as an Ingredient in other Foods]

This part is subject to further consideration.