



I

The motion papers showed the imported merchandise in question to be menadione sodium bisulfite ("MSB"), menadione sodium bisulfite complex ("MSBC"), menadione dimethylpyrimidinol bisulfite ("MPB"), or menadione nicotinamide bisulfite ("MNB"), each of which substance is added to animal feeds. After ingestion, the menadione in these products is converted into a form of vitamin K<sub>2</sub>, specifically K<sub>2(20)</sub>.<sup>1</sup> The parties agree that K<sub>1</sub> and K<sub>2</sub> are vitamins for purposes of the Harmonized Tariff Schedule of the United States ("HTSUS"), classified under heading 2936, and that the chemical structures of naturally-occurring vitamin K<sub>1</sub> ("phylloquinone") and vitamin K<sub>2</sub> ("menaquinones") are 2-methyl-3-phytyl-1, 4-naphthoquinone, and 2-methyl-3-alltrans-polyprenyl-1, 4-naphthoquinone, respectively. See Slip Op. 03-67, p. 4, 27 CIT at \_\_\_\_.

The U.S. Customs Service declined to classify plaintiff's goods under HTSUS heading 2936 on the ground that it does not cover "synthetic substitutes for vitamins", the essence of which was defined in the motion papers as

a synthesized chemical compound that is not found in nature but has vitamin activity. This differs from a

---

<sup>1</sup> See Slip Op. 03-67, p. 4, 27 CIT at \_\_\_\_\_. As stated at the trial,

the well-defined role of Vitamin K is to synthesize proteins that are needed for normal blood coagulation. In the absence of Vitamin K[,] animals can experience hemorrhagic events.

Transcript ("Tr."), pp. 13-14. Cf. id. at 20.

synthetically reproduced vitamin whose structure is found in nature but has been synthesized from other chemicals.<sup>2</sup>

Whereupon the defendant rests on HTSUS heading 2914 ("Ketones and quinones, whether or not with other oxygen function, and their halogenated, sulfonated, nitrated, or nitrosated derivatives") or heading 2933 ("Heterocyclic compounds with nitrogen hetero-atom(s) only; nucleic acids and their salts") as the correct classification(s).<sup>3</sup>

A

The trial was conducted pursuant to a pretrial order, Schedule C of which set forth the following uncontested facts:

---

<sup>2</sup> Slip Op. 03-67, p. 5, 27 CIT at \_\_\_\_\_. The defendant asserts now as a contested fact that

Customs excluded the imported products from classification under Heading 2936 because they are not natural precursors of the natural vitamins K<sub>1</sub> and K<sub>2</sub>, they are not naturally occurring vitamins, they are not synthetic reproductions of naturally occurring vitamins, nor are they derivatives thereof, they are not provitamins within the meaning of Heading 2936, and because of the exclusions in the HTSUS Explanatory Notes for Heading 2936.

Pretrial Order, Schedule C-2, para. 15. See also Defendant United States' Proposed Findings of Fact and Conclusions of Law [hereinafter referred to as "Defendant's Post-Trial Brief"], p. 2.

<sup>3</sup> See Defendant's Post-Trial Brief, p. 2. On its part, the plaintiff reiterates that,

[w]hile the parties agree that heading 2914 and 2933 describe the imported merchandise, if such merchandise is also described under heading 2936, that heading prevails in accordance with headnote 3 to HTSUS Chapter 29.

Plaintiff's Post-Trial Brief, p. 1 n. 2. See Slip Op. 03-67, pp. 8-9, 27 CIT at \_\_\_\_\_.

1. The principal use of the imported products is as a component in animal feed premixes, in particular poultry feed premixes, to provide vitamin K nutrition to the animal.

2. Vitamin K<sub>1</sub> (phylloquinone) and vitamin K<sub>2</sub> (menaquinones) are not used in animal feeds because they are too unstable to withstand the feed pellet manufacturing process and too costly in comparison with the imported MSB, MSBC, MPB or MNB.

3. Menadione is a highly reactive substance which must be derivatized before it can be used commercially in the production of animal feeds.

4. A provitamin is a substance that, after ingestion, is converted into a vitamin by the human or animal body.

5. After ingestion, the menadione in MSB, MSBC, MPB and MNB is converted into menaquinone-4 in the liver of the chicken by a natural process.

6. Menadione has been found in the *Asplenium Lacinatum* fern and in the husks of Black and English walnuts. The chemical structure of naturally occurring menadione is 2-methyl-1, 4[-]naphthoquinone.

7. Menadione sodium bisulfite was first synthesized by Moore and Kirchmeyer, which resulted in U.S. Patent No. 2,367,302, patented January 16, 1945. . . .

8. Menadione Dimethylpyrimidinol Bisulfite was first synthesized by Nanninga, which resulted in U.S. Patent No. 3,325,169, patented June 27, 1967. . . .

9. The products imported by plaintiff, MSB, MSBC, MPB, and MNB[,] are derivatives of menadione.

Given these representations in the pretrial order, the plaintiff submits that the central issue before the court in this case is whether menadione is a natural provitamin. See Tr., p. 6. On its part, the defendant also listed this as the number one issue but proceeded to propound five additional questions about the

specific "products in issue".<sup>4</sup> All of them focus, of course, on the meaning of HTSUS heading 2936:

Provitamins and vitamins, natural or reproduced by synthesis (including natural concentrates), derivatives thereof used primarily as vitamins, and intermixtures of the foregoing, whether or not in any solvent[.]

(1)

The answer to the first issue is clear on the record developed herein. As the parties have stipulated, a provitamin is a substance that is converted within the body of an animal into a vitamin after ingestion. See, e.g., Tr., pp. 12, 14, 180. Again as stipulated, menadione has been determined to exist in nature. See, e.g., Plaintiff's Exhibit 4 and Defendant's Exhibit P (Binder, Benson & Flath, Eight 1,4-Naphthoquinones from Juglans, 28 *Phytochemistry* 2799 (1989)); Plaintiff's Exhibit 5 and Defendant's Exhibit Q (Gupta, Khanna & Sharma, Chemical Components of *Asplenium Laciniatum* (1976)); Tr., pp. 16-17, 35, 140-41, 162-63. And, after ingestion by a chicken, menadione is converted into a form of vitamin K<sub>2</sub>, specifically, vitamin K<sub>2(20)</sub> or menaquinone-4. Compare Slip Op. 03-67, p. 4, para. 11, 27 CIT at \_\_\_, with Pretrial Order,

---

<sup>4</sup> Compare Pretrial Order, Schedule F-1, with id., Schedule F-2. Now, the plaintiff asserts that "the Court conducted a trial to determine whether the imported products are derivatives of a natural provitamin." Plaintiff's Post-Trial Brief, p. 2.

To be sure, the parties, not the court, essentially conducted the trial, during which and after which the undersigned has been concerned with more than just this issue.

Schedule C, para. 5 and Tr. pp. 17-18, 33, 167-69, 187-88. Where-  
upon the plaintiff would now limit the

issues for this Court to decide [to] whether menadione is  
a "natural" provitamin and whether the imported products  
are used primarily as vitamins.

Plaintiff's Post-Trial Brief, pp. 2-3.

The HTSUS, at least chapter 29 thereof, does not define  
natural. Its predecessor Tariff Schedules of the United States  
("TSUS") did define "natural substances" as

those substances found in nature which comprise whole  
plants and herbs, anatomical parts thereof, vegetable  
saps, extracts, secretions and other constituents  
thereof; whole animals, anatomical parts thereof, glands  
or other animal organs, extracts, secretions and other  
constituents thereof, and which have not had changes made  
in their molecular structure as found in nature[.]

TSUS Schedule 4, Part 3, Headnote 3(a) (1986). And Customs has let  
it be known that TSUS definitions

are applied by [it] to the HTSUS, in the absence of  
specific definitions, since these definitions are com-  
monly accepted and it is clear from the wording of the  
HTSUS provisions that the same distinction between  
natural and synthetic is intended.

HQ 086658, p. 2 (March 21, 1990). In Schering Corporation v.  
United States, 1 CIT 217, 219 (1981), the court pointed out that,  
for a substance to be natural within the meaning of the foregoing  
TSUS headnote 3(a),

(1) It must be found in nature in a vegetable or animal  
source; and (2) it cannot have had changes made in its  
molecular structure as found in nature.

Moreover, absent contrary legislative intent, tariff terms can be construed in accordance with their common or popular meaning. E.g., Marubeni America Corp. v. United States, 35 F.3d 530, 534 (Fed.Cir. 1994). And, to

assist it in ascertaining the common meaning of a tariff term, the court may rely upon its own understanding of the terms used and it may consult lexicographic and scientific authorities, dictionaries, and other reliable information sources.

Brookside Veneers, Ltd. v. United States, 847 F.2d 786, 789 (Fed.Cir. 1988). Here, this court can and does accept "natural" as the pristine adjectival reference to proven existence in nature<sup>5</sup>, notwithstanding the fact that certain lexicographers and parsers of the English language have sought to expand this seminal usage to the limits of human experience. See, e.g., Webster's New International Dictionary of the English Language, 2d ed. Unabridged, pp. 1630-31 (1945); Funk & Wagnalls Standard Dictionary of the English Language, Int'l ed., pp. 845-46 (1963). Whichever approach, the court finds menadione to be a natural provitamin. See, e.g., Tr., p. 189.

(2)

The answer to the second triable issue posited by the defendant in its schedule F-2 to the pretrial order, namely, whether the products under consideration are natural vitamins or natural provitamins, is also clear. They are neither. As far as this record is concerned, none has been found to exist in nature,

---

<sup>5</sup> Cf. Tr., pp. 12, 13.

and the court can only find that none would exist but for the ingenuity of man.

(3)

Defendant's next issue is whether plaintiff's products are reproductions by synthesis of natural vitamins or natural provitamins. The court cannot find that they are, nor does the plaintiff argue otherwise.

(4)

The defendant articulates its remaining "triable issues" as follows:

4. Whether the products in issue are derivatives, used primarily as vitamins, of natural vitamins or natural provitamins.
5. Whether the bisulfite adducts of menodione [*sic*], in issue, represent an "added stabilizer," within the meaning of HTSUS Chapter 29 Note 1(f).
6. Whether the products in issue are intermixtures of: provitamins and vitamins, natural or reproduced by synthesis, and/or derivatives thereof used primarily as vitamins.<sup>6</sup>

---

<sup>6</sup> Pretrial Order, Schedule F-2. The HTSUS headnote 1 referred to provides that the headings of chapter 29 apply, in part, only to:

- (a) Separate chemically defined organic compounds, whether or not containing impurities;
- (b) Mixtures of two or more isomers of the same organic compound (whether or not containing impurities), except mixtures of acyclic hydrocarbon isomers (other than stereoisomers), whether or not saturated (chapter 27);
- (c) The products of headings 2936 to 2939 or the sugar ethers and sugar esters, and their

(footnote continued)



The answer to number 4 is in the affirmative, given the record support, supra, for the court's finding that menadione is a natural provitamin and the parties' above-numbered stipulated fact 9 that MSB, MSBC, MPB and MNB are derivatives<sup>7</sup> of menadione. See Tr., pp.

---

salts, of heading 2940, or the products of heading 2941, whether or not chemically defined;

- (d) Products mentioned in (a), (b) or (c) above dissolved in water;
- (e) Products mentioned in (a), (b) or (c) above dissolved in other solvents provided that the solution constitutes a normal and necessary method of putting up these products adopted solely for reasons of safety or for transport and that the solvent does not render the product particularly suitable for specific use rather than for general use;
- (f) The products mentioned in (a), (b), (c), (d) or (e) above with an added stabilizer necessary for their preservation or transport;
- . . . .

<sup>7</sup> In answering an interrogatory propounded by the plaintiff pretrial, the defendant stated that, for

purposes of Heading 2936, a chemical derivative is a compound containing the same basic structure as its theoretical parent compound without any significant portion of the parent compound having been removed. Our definition is consistent with the definition in HRL 085775, dated February 27, 1990, which states: "a derivative of a compound results from the modification of that compound by adding to the moiety or the basic structure of the compound without loss of that basic structure."

Plaintiff's Exhibit 15 [Defendant's Response to Plaintiff's First Interrogatories], p. 3, para. 9; Tr., p. 28. The defendant pointed in subsequent paragraph 12 of its Response to definitions of derivatives found in Hackh's Chemical Dictionary, Webster's Third New International Dictionary, and in the sixth edition of Van Nostrand's Scientific Encyclopedia. See Tr., pp. 28-29. Cf. id. at 70-71.

28-29, 66, 104, 173, 196. See also Defendant's Post-Trial Brief, pp. 4-5, 22-23. Moreover, the evidence shows that the bisulfite adducts of these products are stabilizers necessary for their preservation or transport. See, e.g., Tr., pp. 66, 184; Slip Op. 03-67, p. 6, para. 23, 27 CIT at \_\_\_\_\_. Finally, the primary if not only use of these products shown on the record is "to provide vitamin K nutrition to the animal." Pretrial Order, Schedule C, para. 1. This occurs within the body of the animal when the sodium bisulfite stabilizer becomes disassociated (and then excreted), leaving the provitamin menadione for conversion to vitamin K<sub>2(20)</sub>. See, e.g., Tr., pp. 25-26, 44, 53, 78-79, 112, 149, 167-68, 178-79.

B

The defendant has admitted that HTSUS heading 2936 covers "synthetic derivatives of naturally occurring vitamins or provitamins". Plaintiff's Exhibit 17 [Defendant's Response to Plaintiff's First Request for Admission], p. 1, para. 1. Indeed, the Explanatory Notes to that heading emphasize this point. See Defendant's Exhibit N, p. 462, para. (a). Moreover, the HTSUS chapter 29 subheading note 1 states:

Within any one heading of this chapter, derivatives of a chemical compound (or group of chemical compounds) are to be classified in the same subheading as that compound (or group of compounds) provided that they are not more specifically covered by any other subheading and that there is no residual subheading named "Other" in the series of subheadings concerned.

The defendant refers the court to that part of the Explanatory Notes to HTSUS heading 2936 which would exclude from its coverage "[s]ynthetic substitutes for vitamins", listing, among others,

Vitamin K<sub>3</sub>: menadione, menaphthone, methyl-naphthone or 2-methyl-1, 4-naphthoquinone; sodium salt of 2-methyl-1, 4-naphthoquinone bisulphite derivative (**heading 29.14**); Menadiol or 1,4-dihydroxy-2-methylnaphthalene (**heading 29.07**).

Defendant's Exhibit N, p. 468, para. (2)(a) (bold face in original).

The plaintiff claims that this exclusion misses the mark -- as proven in this case. First, at the time of publication in 1964 of the Third Impression of the Brussels Nomenclature, menadione was considered to be a form of vitamin K and given the subscript 3. Since then, science has concluded that menadione is not a vitamin, rather a provitamin for menaquinone-4, a form of vitamin K<sub>2</sub>. See Tr., pp. 33-34. Hence, K<sub>3</sub> is no longer the proper reference. See id. at 33-34, 57, 120. Second, menadione has since been discovered in nature. It is not a synthetic substitute for a vitamin, nor are provitamins such synthetic substitutes.

The courts have consistently pointed out that the HTSUS Explanatory Notes are not legally binding but that they may be consulted for guidance and are generally indicative of the proper interpretation of the various provisions of the Harmonized Tariff

Schedule. See, e.g., Park B. Smith, Ltd. v. United States, 347 F.3d 922, 929 n. 3 (Fed.Cir. 2003); Russell Stadelman & Co. v. United States, 242 F.3d 1044, 1050 (Fed.Cir. 2001); Carl Zeiss, Inc. v. United States, 195 F.3d 1375, 1378 n. 1 (Fed.Cir. 1999); Intercontinental Marble Corp. v. United States, 27 CIT \_\_, \_\_, 264 F.Supp.2d 1306, 1320 (2003); Toy Biz, Inc. v. United States, 26 CIT \_\_, \_\_, 219 F.Supp.2d 1289, 1293-94 (2002); North American Processing Co. v. United States, 23 CIT 385, 387 n. 5, 56 F.Supp.2d 1174, 1176 n. 5 (1999), aff'd, 236 F.3d 695 (Fed.Cir. 2001).

To consider the above-quoted exclusionary note is to lead the court to conclude that it is not of moment in this case. To repeat, menadione is a natural provitamin. See, e.g., Tr., p. 31. It is not a synthetic substitute for vitamin K, nor are the bisulfite adducts that simply stabilize the "highly reactive substance" that is menadione on its intended path to a chicken's liver. Moreover, the court notes in passing that a subsection of that exclusionary note (2), namely, "(d) Cysteine, a vitamin B substitute (**heading 29.30**)", seems out of place<sup>8</sup> in that the other four lettered subsections, (a), (b), (c) and (e), at least refer to forms of K, the vitamin at issue herein. In short, all that the record developed herein supports is a finding that the note(s) at bar could stand some correction and updating.

---

<sup>8</sup> See Tr., pp. 75, 177-78.

II

As pointed out in slip opinion 03-67, the court first construes the language of an HTSUS heading, and any relevant section or chapter notes, to determine whether merchandise at issue is classifiable under that heading. Only after determining that it is classifiable thereunder should the court look to subheadings to determine the correct classification of the particular good. 27 CIT at \_\_\_, quoting Orlando Food Corp. v. United States, 140 F.3d 1437, 1440 (Fed.Cir. 1998); Schulstad USA, Inc. v. United States, 26 CIT \_\_\_, \_\_\_, 240 F.Supp.2d 1335, 1338 (2002). Three subheadings of heading 2936 have the same setting in the matrix, to wit, 2936.10.00 ("Provitamins, unmixed"), 2936.21.00 ("Vitamins and their derivatives, unmixed"), and 2936.90.00 ("Other, including natural concentrates"). Clearly, plaintiff's products are not vitamins and their derivatives within the purview of subheading 2936.21, nor are they provitamins, unmixed per 2936.10.00. Ergo, each of them falls within the basket provision, subheading 2936.90.00. Cf. Plaintiff's Post-Trial Brief, p. 17:

. . . [E]ven if heading 2936 does not by its very terms include synthetic derivatives of provitamins, Subheading Note 1 directs the classification of such derivatives therein, specifically, under subheading 2936.90.0000, HTSUS.

III

In view of the foregoing, which represents this court's findings of fact and conclusions of law within the meaning of USCIT Rule 52(a), the summary "LAW AND ANALYSIS" set forth in HQ 957946 (Dec. 10, 1996) and HQ 950338 (Feb. 16, 1993), which the defendant offered in evidence as exhibits Y and Z and upon which it now relies<sup>9</sup>, is not controlling. As the Supreme Court explained in Skidmore v. Swift & Co., 323 U.S. 134, 140 (1944), and reaffirmed in United States v. Mead Corp., 533 U.S. 218, 228 (2001), the

weight [accorded an administrative ruling] in a particular case will depend upon the thoroughness evident in its consideration, the validity of its reasoning, its consistency with earlier and later pronouncements, and all those factors which give it power to persuade, [even] if lacking power to control.

Here, defendant's classification of plaintiff's products under HTSUS chapter 29 (1994) is entitled to deference, but not to the extent of foreclosure of their most correct classification under subheading 2936.90.00 in accordance with headnote 3 to that chapter. Judgment will enter accordingly.

Decided: New York, New York  
January 29, 2004

Thomas J. Aquilino, Jr.  
Judge

---

<sup>9</sup> See Defendant's Post-Trial Brief, p. 18.