

QUARTERMASTER CORPS
TENTATIVE
SPECIFICATION

C.Q.D. No. 43A
30 September 1943
Amendment-1
20 November 1944

LEMON JUICE POWDER, SYNTHETIC

The following changes and additions shall be made in Quartermaster Corps Tentative Specification CQD No. 43A, dated 30 September 1943.

Page 4.

Paragraph G-2a(1) shall read:

"G-2a(1) The following shall be **legibly** and indelibly printed on the cans of Type I powder:

LEMON JUICE POWDER, SYNTHETIC

With Ascorbic Acid

Net Weight 12 oz.

EACH 8-OUNCE PORTION OF THIS BEVERAGE
FURNISHES A FULL DAILY REQUIREMENT OF
VITAMIN C (30 MILLIGRAMS)

CONTENTS: Dried Pure Lemon Juice with Corn
Sirup, Citric Acid, Dextrose, Ascorbic Acid
(Vitamin C), Lemon Oil, and Tricalcium
Phosphate,*

(*Mention only when used.)

DIRECTIONS FOR PREPARING BEVERAGE:
Mix the contents of this can (12 oz.)
with 5 lbs. sugar and dissolve the
mixture in 6 gal. cold water.

DIRECTIONS FOR PREPARING IMITATION LEMON
JUICE: Dissolve 1 oz. powder in 8 oz. water.

ALLOW WATER JUST CHEMICALLY PURIFIED TO
STAND 30 MINUTES BEFORE ADDING THIS
BEVERAGE POWDER.

(This statement to be printed in bold face capital letters.)

Mfd. & Packed by

----- (Name)

----- (Address)"

(When practicable, the statement relative to purification of the water
should be placed upon the top of the cans.)



Page 5.

Paragraph G-2b shall read:

"G-2b. Envelopes. The outside of the completed package shall be a dull yellow color of such depth and shade that it is suitably camouflaged. Printed matter shall be in a contrasting color (preferably dark blue) to allow easy and legible reading and, unless otherwise specified, shall convey the following information:

G-2b(1). (One Side.)

LEMON JUICE
POWDER
SYNTHETIC
Vitamin C Potency
60 Milligrams
Net Wt. 7 Grams

Mfd. & Packed by
----- (Name)
----- (Address)

DIRECTIONS ON OTHER SIDE"

Paragraph G-2c shall read:

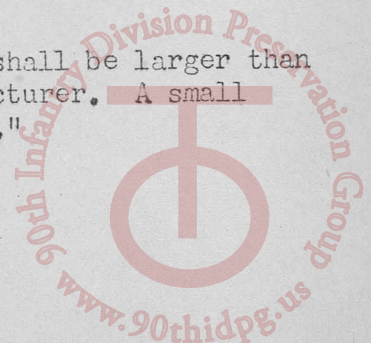
"G-2b(2). (Other Side.)

DIRECTIONS
Dissolve contents
in 2/3 canteen cup
(1 pint) cold water.
Add sugar and stir
well.

. . .

ALLOW WATER JUST
CHEMICALLY PURIFIED
TO STAND 30 MINUTES
BEFORE ADDING THIS
BEVERAGE POWDER.
(This statement to
be printed in bold
face capital letters.)

The type used for printing the directions shall be larger than that used for indicating the name and address of the manufacturer. A small trade-mark may be placed on the package by the manufacturer."



~~QUARTERMASTER~~ CORPS
TENTATIVE
SPECIFICATION

C.Q.D. No. 43A
30 September 1943
Superseding
C.Q.D. No. 43
10 March 1942

LEMON JUICE POWDER, SYNTHETIC

A. APPLICABLE SPECIFICATIONS.

A-1. The following specifications, of the issue in effect on the date of invitation for bids, shall form a part of this specification:-

A-1a. United States Army Specification:-

No. 22-42 - Supplies, Subsistence, for the United States Army, Conditions Governing the Purchase of.

A-1b. Quartermaster Corps Tentative Specifications:-

O.Q.M.G. No. 93 - Boxes; Fiberboard, Corrugated and Solid.

O.Q.M.G. No. 94 - Marking of Outside Shipping Containers by Contractors.

O.Q.M.G. No. 106 - Strapping, Steel, Nailless Type (Flat Steel and Round Steel Wire) for Boxes, Crates and Bales.

C.Q.D. No. 107 - Marking of Cans.

B. TYPES AND GRADE.

B-1. Types:- The product shall be of two types, with or without ascorbic acid (Vitamin C), as follows:

Type I - Lemon Juice Powder, Synthetic, with Ascorbic acid, 7 grams* (Stock No. 56-L-3330)

Lemon Juice Powder, Synthetic, with ascorbic acid, 12 oz.* (Stock No. 56-L-3340)

Type II - Lemon Juice Powder, Synthetic, without ascorbic acid, 12 oz.* (Stock No. 56-L-3355)

B-2. Grade:- The product shall be of the grade herein indicated.

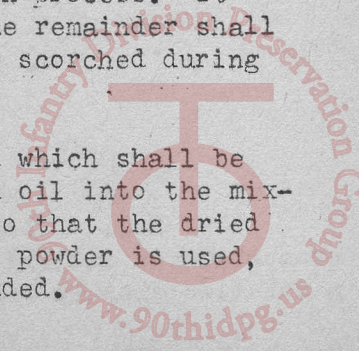
C. MATERIAL AND WORKMANSHIP.

C-1. Material.

C-1a. The powdered lemon juice and corn syrup shall be the dried pure juice of sound mature lemons to which corn syrup has been added in process. It shall contain not less than 17 percent lemon juice solids, and the remainder shall be corn syrup solids. It shall be free from particles which were scorched during the drying process.

A specially modified lemon powder, may be used which shall be prepared by incorporating sufficient partially deternzenized lemon oil into the mixture of lemon juice and corn syrup prior to the drying process, so that the dried powder contains not less than 0.5 percent oil. When this special powder is used, the lemon oil indicated in paragraph E-1a and E-1b need not be added.

This is the approved nomenclature



C-1b. The citric acid shall meet all the purity requirements for the U. S. P. acid, and in addition, it shall be anhydrous.

C-1c. The dextrose shall be anhydrous and on a dry basis it shall analyze not less than 99.8 percent dextrose.

C-1d. The ascorbic acid (Vitamin C) shall be of U. S. P. grade.

C-1e. The oil of lemon shall be a partially deterpenized oil prepared from an expressed essential oil of lemon of good commercial grade. It shall be relatively free from terpenes, and it shall contain no added citral.

C-1f. Tricalcium phosphate, if used, shall be of U. S. P. grade.

C-2. Workmanship.

C-2a. Lemon Juice Powder, Synthetic, and all the ingredients used, shall be prepared, processed, and packaged under modern sanitary conditions, and in accordance with good commercial practice.

C-2b. Lemon Juice Powder, Synthetic, shall be mixed and packaged in an atmosphere which has a relative humidity of not more than 35 percent.

D. GENERAL REQUIREMENTS.

D-1. All deliveries shall conform in every respect to the provisions of the Federal Food, Drug, and Cosmetic Act, and regulations promulgated thereunder.

E. DETAIL REQUIREMENTS.

E-1. Lemon Juice Powder, Synthetic, shall be a uniform mixture free from lumps or cakes.

E-1a. Type I powder shall be made according to the following formula:

Powdered Lemon Juice and Corn Syrup	- 50 pounds
Anhydrous Citric Acid	- 34 "
Anhydrous Dextrose	- 14 $\frac{1}{2}$ "
Oil of Lemon (partially deterpenized)	- $\frac{1}{4}$ "
Ascorbic Acid (not less than)	384 grams

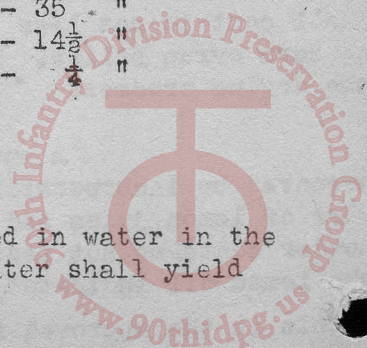
Tricalcium phosphate may be added, but in no case shall the quantity used exceed 0.5 percent.

E-1b. Type II powder shall be made according to the following formula:

Powdered Lemon Juice and Corn Syrup	- 50 pounds
Anhydrous Citric Acid	- 35 "
Anhydrous Dextrose	- 14 $\frac{1}{2}$ "
Oil of Lemon (partially deterpenized)	- $\frac{1}{4}$ "

Tricalcium phosphate may be added, but in no case shall the quantity used exceed 0.5 percent.

E-2. Lemon Juice Powder, Synthetic, when dissolved in water in the proportion of one (1) ounce of powder to eight (8) ounces of water shall yield a solution closely resembling fresh lemon juice.



E-3. Lemon Juice Powder, Synthetic, shall be readily soluble in cold water (65° F.), and when mixed with sugar and dissolved in water in the proportion of 12 ounces of powder and 5 pounds of sugar to 6 gallons of water, shall yield a beverage with good lemonade flavor, free from stale, bitter, grassy, musty, terebinthic, metallic, or other undesirable flavors.

E-4. Lemon Juice Powder, Synthetic, shall contain not more than 1.5 percent moisture, and the total acidity, determined by titration and calculated as anhydrous citric acid, shall be not less than 39 percent by weight.

E-5. The pH value, determined electrometrically, shall be not less than 1.90 nor more than 2.25 when $4\frac{1}{2}$ grams of Lemon Juice Powder, Synthetic, are dissolved in 50 milliliters of distilled water.

E-6. Lemon Juice Powder, Synthetic, shall have an ash content of not more than 1.5 percent.

E-7. Type I powder, With Ascorbic Acid, shall contain not less than 0.24 grams of ascorbic acid per ounce of product.

F. METHODS OF SAMPLING, INSPECTION, AND TESTS.

F-1. Unless otherwise specified, inspection shall be made at the point of origin.

F-2. Unless otherwise specified, chemical analyses, if required, shall be made in accordance with methods of the Association of Official Agricultural Chemists in effect on date of invitation for bids.

F-3. The amount of ascorbic acid in the product shall be determined by the indophenol titration method as described in the 1939 edition of "The Vitamins," published by the American Medical Association.

F-4. Moisture determination shall be made by the official A.O.A.C. vacuum-oven method for fruits and fruit products by heating 2 grams of the product at 70° C. to constant weight (6 hours) in partial vacuum, having pressure equivalent to 100 millimeters or less of mercury.

F-5. Awards will be made only after the plant, package, and samples of the product have been approved by the Quartermaster Corps Subsistence Research Laboratory, Chicago Quartermaster Depot, Chicago 9, Illinois.

G. PACKAGING, LABELING, PACKING, AND MARKING FOR SHIPMENT.

G-1. Packaging.— Type I powder, With Ascorbic Acid, shall be packaged either 12 ounces in a can of suitable size or 7 grams in an envelope as described below. Type II powder, Without Ascorbic Acid, shall be packaged only in a 12 ounce sanitary can as described below.

G-1a. Cans.— The cans shall be round, hermetically sealed, open-top style, metal cans with soldered side seams and compound-lined double-seamed ends. They shall be made of 0.5 pound electrolytic tin plate throughout or the body of the can made from 0.5 pound electrolytic tin plate and the ends of bonderized black plate. They shall be protected on their outside surfaces up to the solder of the side seam, with a suitable corrosion-resistant enamel and enameled inside with a

coating suitable for the product. No undue headspace shall be present in the cans and the product shall be vacuum gas-packed by first removing the air from the filled can and replacing this with nitrogen or carbon dioxide gas.

G-1b. Envelopes.— The envelopes shall be flat and not over 3-1/8 inches long and 2-3/8 inches wide overall. They shall be made from a laminated sheet composed of a cellulose acetate film not less than 0.0008 inch thick laminated to aluminum foil not less than 0.0008 inch thick, and coated on the foil side with an odorless, permanently flexible, heat-sealing compound such as a modified polyvinyl acetate. This coating shall be heavy enough to provide a satisfactory heat seal.

G-1b(1) The laminating agent used to combine the cellulose acetate to the foil shall be a compound similar to the coating described above.

G-1b(2) The package shall be formed by placing the product between two sheets of the laminated film and heat-sealing the two sheets together on all four sides. The cellulose acetate film shall be on the outside of the package. All heat seals shall be at least 3/16 of an inch in width.

G-2. Labeling.

G-2a. Cans.— The label on each can of Type I powder, With Ascorbic Acid, if possible, shall be lithographed. The labels on cans of Type II powder, Without Ascorbic Acid, shall be either lithographed on the body, or else the information shall be printed on a label which goes around the cylindrical surface. The printed label shall have its ends overlapping at least one-fourth inch, and shall be glued with a water-resistant adhesive.

If the information cannot be lithographed on cans of Type I powder the information shall be printed on a label as specified and in addition the cans of Type I powder shall be indelibly marked with the legend LEMON POWDER or LEMON in accordance with Quartermaster Corps Tentative Specification C.Q.D. No. 107.

G-2a(1) The following shall be legibly and indelibly printed on the cans of Type I powder:

LEMON JUICE POWDER, SYNTHETIC

Type I, With Ascorbic Acid

Net Weight - 12 ounces

CONTENTS: Dried Pure Lemon Juice with Corn Syrup, Citric Acid, Dextrose, Ascorbic Acid (Vitamin C), Lemon Oil, and Tricalcium Phosphate.*

(*Mention only when used.)

DIRECTION FOR PREPARING A BEVERAGE: Mix the contents of this can (12 ounces) with 5 pounds of sugar and dissolve the mixture in 6 gallons of cold water.



WASTE

EACH 8 OUNCE PORTION OF THIS BEVERAGE FURNISHES A FULL DAILY REQUIREMENT OF VITAMIN C (30 MILLIGRAMS).

DIRECTIONS FOR PREPARING IMITATION LEMON JUICE: Dissolve 1 ounce of powder in 8 ounces of water.

Manufactured by ---

(Name)

(Address)

G-2a(2) The following shall be legibly and indelibly printed on the cans or labels of Type II powder:

LEMON JUICE POWDER, SYNTHETIC

Type II, Without Ascorbic Acid

Net Weight - 12 ounces

CONTENTS: Dried Pure Lemon Juice with Corn Syrup, Citric Acid, Dextrose, Lemon Oil, and Tricalcium Phosphate.*

(*Mention only when used.)

DIRECTIONS FOR PREPARING A BEVERAGE: Mix the contents of this can (12 ounces) with 5 pounds of sugar and dissolve the mixture in 6 gallons of cold water.

DIRECTIONS FOR PREPARING IMITATION LEMON JUICE: Dissolve 1 ounce of powder in 8 ounces of water.

Manufactured by --

(Name)

(Address)

G-2b. Envelopes.— The outside of the completed package shall be a dull yellow color of such depth and shade that it is suitably camouflaged. Printed matter shall be in a contrasting color (preferably dark blue) to allow easy and legible reading and, unless otherwise specified, shall convey the following information:

LEMON JUICE POWDER, SYNTHETIC

Net Weight - 7 grams

VITAMIN C POTENCY - 60 MILLIGRAMS

CONTENTS: Dried Pure Lemon Juice with Corn Syrup, Citric Acid, Dextrose, Ascorbic Acid (Vitamin C), and Lemon Oil. (Also mention Tricalcium



Phosphate if used.)

DIRECTIONS: Dissolve contents in 2/3 canteen cup (1 pint) cold water, add sugar, and stir well.

Manufactured by _____
 _____ (Name)
 _____ (Address)

The type used for printing the directions shall be larger than that used for listing the ingredients and the name and address of the manufacturer.

G-3. Packing:

G-3a. Domestic.— Unless otherwise specified, cans of Type II powder, Without Ascorbic Acid, and envelopes of Type I powder, With Ascorbic Acid, shall be packed in containers complying with the requirements of Rule 40 or 41, Consolidated Freight Classification.

G-3b. Export.— Forty-eight (48) 12-ounce cans of Type I powder, With Ascorbic Acid, shall be packed on end in a fiberboard box and sleeve conforming with Quartermaster Corps Tentative Specification, OQMG No. 93, Style RSC-SL, Type SF, Grade 1 or 2, as specified by the procurement agency. The arrangement of the cans shall be as follows:

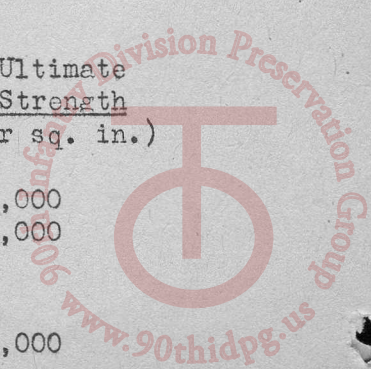
- 6 in length
- 4 in width
- 2 in depth

A layer pad made from either 0.040 chipboard or non-test B or C flute double-faced corrugated board shall be used between the tiers. Before the sleeve is applied, all flaps of the box shall be closed by means of a water-resistant adhesive throughout the entire area of contact between the flaps, by metal stitching, or by combination of these methods.

After the sleeve is applied, the case shall be strapped in accordance with Quartermaster Corps Tentative Specification, O.Q.M.G. No. 106 as follows:

The container shall be strapped with two (2) steel straps protected with a rust-resistant coating. Flat strapping is preferred, but round strapping is acceptable. The minimum gauge or size of the strap shall be as specified in the following table:

<u>ROUND STRAPS</u>		Minimum Ultimate Tensile Strength (Lbs. per sq. in.)
<u>Gauge</u>		
15		100,000
16		140,000
<u>FLAT STRAPS</u>		
<u>Size</u>		
3/8" x .015"		80,000



Seals shall provide a joint breaking strength of not less than 75 percent of the strap breaking strength. The straps shall be applied at right angles to each other with one strap centered over top, sides, and bottom, and the other strap centered over top, ends, and bottom. The longest strap shall be applied first.

G-4. Marking.

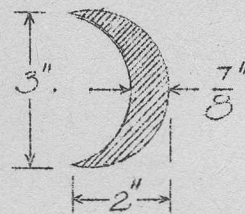
G-4a. The shipping cases shall be marked in accordance with Quartermaster Corps Tentative Specification O.Q.M.G. No. 94.

G-4b. The following information shall be printed or legibly stenciled on the upper two-thirds of only one end of the shipping case, in letters between 1/2 and 1-1/2 inches high, all letters being of the same height:

CONT --- (Contract No.)
 LEMON JUICE POWDER
 SYN. WITH VITAMIN C

48 - 12 ounce cans

WT --- CU --- (Gross weight in pounds
 and cubic displacement
 to the nearest 1/10 cubic
 foot)



G-4c. Near the upper right-hand corner of the front side of the case, the marked end being on the right, the following information shall be printed or legibly stenciled in letters 1/2 to 1 inch high, the space occupied having an area not greater than than 42 square inches:

--- --- (Name of Contractor)
 --- --- (Month and Year Packed)

REQ. --- (Requisition No.) (required on at least
 10 cases nearest the door of the
 conveyance.)

In place of marking the front side of the case, this information may be printed on a label not over 42 square inches in area, using bold letters not less than 1/4 inch high. The label shall be affixed near the upper right-hand corner of the case with a water-resistant adhesive and covered with a waterproof lacquer.

G-4d. No other markings, except those required by statute, shall appear.

G-4e. The ink used shall be both sunfast and waterfast, shall take on fiber, and shall be black unless the outside of the case is black when it shall be either white or yellow.

