

SYRUPUS ACACIÆ AROMATICUS.

Aromatic Syrup of Acacia.

Syr. Acac. Arom.

Acacia, in fine powder.....	100.0 Gm.
Sodium Benzoate.....	1.0 Gm.
Methyl Salicylate.....	1.0 cc.
Syrup, a sufficient quantity, To make.....	1000.0 cc.

Mix the acacia, placed in a dry mortar, with the sodium benzoate. Add the syrup, at first in small portions, with active trituration, so as to avoid the formation of lumps; and, gradually, the remainder of the syrup. Bring the preparation to a boil and when cool strain through cheese cloth. Finally incorporate the methyl salicylate by thorough agitation and add enough syrup to make the product measure 1000 cc.

HOW MUCH IS A TEASPOONFUL?*

BY F. W. NITARDY.

During the last twenty years considerable effort has been made toward more accurate standardization of medicinal products. Tolerances have also been developed for individual dose forms such as tablets, capsules, ampuls, etc., and these tolerances, determined upon very largely by a committee of the A. D. M. A. and A. P. M. A., have received official sanction from the Department of Agriculture and other bodies. In view of this effort for accuracy in potency and dosage, it appears wise to again give consideration to the dose measure most commonly used by the public in the use of liquid medicinal substances, namely, the teaspoon.

Efforts have been made from time to time to supplant the teaspoon with an accurately graduated medicine glass, and while such idea is laudable it has met with little success, probably because of the convenience of the teaspoon and the almost universal habit on the part of the public to use it and, possibly, its belief that it represents a reasonably accurate measuring device for such purposes.

Originally, a teaspoonful was considered the equivalent of the fluidram and because a fluidram is approximately 4 cc., the equivalent of 4 cc. for a teaspoonful has been more or less generally accepted since the metric system became official, notwithstanding that it is quite an incorrect equivalent. Unfortunately, this incorrect equivalent has official sanction, but a survey of literature indicates that attempts have been made to adopt the more nearly correct equivalent of 5 cc., also that these efforts received the approval of both the pharmaceutical and medical professions, but for some reason not clear failed in being adopted by the U. S. P., which still gives the approximate measure of a teaspoon as 4 cc.

"Arny's Principles of Pharmacy" (Second Edition, 1924) states, "A teaspoonful is supposed to be one fluidrachm." "Remington's Practice of Pharmacy" (Seventh Edition, 1926) states, "A teaspoonful is estimated as 4 cc. In almost all cases, the modern tea cups, tablespoons, dessert spoons and teaspoons after careful test by many authorities were found to average 25%

* Section on Practical Pharmacy and Dispensing, A. Ph. A., Washington meeting, 1934.

greater capacity than the theoretical quantities given above." "The American Illustrated Medical Dictionary," Dorland (Sixteenth Edition, 1932), defines a teaspoon as "A spoon of small size containing about 1 fluidrachm or 4 cc."

In Europe the average content of a teaspoon is quite generally recognized as 5 cc., that figure being given in the French Codex, in the German Pharmacopœia VI (1926), the Danish Pharmacopœia VIII (1933) and in the Swiss Pharmacopœia (1933). The British Pharmacopœia includes a statement regarding the inaccuracy of dosages expressed in teaspoonfuls and dessertspoonfuls and recommends that dosages should be specified in terms of more definite units. This Pharmacopœia does not give any capacity for a teaspoon. A number of articles on this subject have been published during the present century. Abstracts of these are as follows:

*Standardizing Dose Measures.*¹—Attention is called to possible errors caused by the inaccuracy of medicine measures and that by the fact that these measures are poorly adapted for accurately measuring liquids in small quantities. The author proposes certain regulations which had previously been adopted at a pharmaceutical meeting of the Philadelphia College of Pharmacy. These resolutions recommended the use of graduated glass dose-measures so constructed that the heights of the contained liquid at a spoonful mark would be greater than its diameter; that where spoons are used as medicine measures, the French Codex definition of a spoonful be applied. This definition reads as follows: "A spoon is full when the contained liquid comes up to but does not show a curve above the upward edge or rim of the bowl. The third recommendation was that 1 teaspoonful should be considered equivalent to 5 cc., 1 dessertspoonful 10 cc. and 1 tablespoonful 15 cc. These resolutions were seconded and adopted by the ASSOCIATION.

*Dose Measures and Measured Doses.*²—In a series of experiments it was shown that the average teaspoonful dose as measured with the same spoon by different people varied in measurement from 3 to 7 cubic centimeters. Medicine glasses were also found to be inaccurate, varying considerably at the different graduations and most of them being so constructed that small quantities could not be measured with accuracy.

*The Approximate Measures of the U. S. P.*³—Wilbert states that the resolutions endorsed by the ASSOCIATION in 1902 were also adopted by the American Medical Association in 1903, in spite of which the members of the Committee on Revision of the U. S. P. failed to adopt the measures recommended. Wilbert made permanent casts of the capacity of a number of different sizes of spoons in common use as follows: The bowl of the spoon carefully washed and perfectly dried was coated with a thin film of oil and then filled with the requisite quantity of dental plaster which had been previously mixed with sufficient quantity of water to give it the consistency of cream. The spoon was supported until the plaster had set. The weight of the cake was then determined and the capacity of the spoon calculated. It was found that teaspoons evenly filled had a capacity of from 4.4 to 5.5 cc. Wilbert recommends that the 5-cc. equivalent for teaspoon be generally adopted.

¹ M. I. Wilbert, Proc. A. Ph. A., 50 (1902), 408.

² M. I. Wilbert, Am. J. Pharm., 74 (1902), 120.

³ M. I. Wilbert, Proc., A. Ph. A., 53 (1905), 301.

*The Tyranny of the Teaspoon.*¹—Arguments very similar to those previously presented by Wilbert are given. Army found that capacities of 9 teaspoons ranged from 3.8 to 7.8 mils. Only one of these approached the 4-mil. basis. All the others were closer to 5 mils. than to the 4-mil. mark.

*Standard Teaspoon Needed.*²—Examination of teaspoons of four different makes showed two to deliver 5.37 cc., one to deliver 7.39 cc. and one to deliver 4.22 cc. It is recommended that properly graduated glasses be used instead of teaspoons.

*Variation in the Capacity of Teaspoons and Other Measures.*³—Data are given showing the capacity specified by several pharmacopœias for the teaspoon, dessert-spoon and tablespoon. Because of the variations which occur in these specifications, the author recommends international unification. Data as given showed a still greater variation in the capacities of these measures as actually found in general use.

The writer checked up on capacity of teaspoons recently and found the following. (Filled so the liquid is exactly level with the edge of the bowl.)

1. Towle sterling teaspoon (Lady Diana)	5.0 cc.
2. Community plate teaspoon (Patrician)	5.5 cc.
3. Plated ware teaspoon (hotel ware)	5.0 cc.
4. Plated ware teaspoon (restaurant)	5.0 cc.
5. Plated ware teaspoon (5 and 10¢ store)	5.0 cc.
6. Plated ware teaspoon (nondescript)	5.0 cc.

It will be seen from the above that of six representative varieties of teaspoons, five hold just 5 cc. and one 10% more than this. It is believed that the sterling silver spoon given under "1" above is quite representative of the capacity of sterling silver spoons available in the market to-day as manufactured by Towle, International, etc., and that the community plate spoon given under "2" is probably quite representative of the better class of plated ware available in the market to-day.

Aside from the above spoons, I also determined the capacity of a very old European teaspoon, definitely more than a hundred years old. This spoon held 4.4 cc. and it is my impression that old European spoons of this type are generally somewhat smaller and have a somewhat different shaped bowl than the teaspoon in common use in this country, but even this type of spoon seems to hold definitely more than 4 cc.

It would appear that in view of the foregoing a renewed effort should be made to induce the U. S. P. to recognize 5 cc. as the most nearly correct metric equivalent for an average teaspoonful.

¹ H. V. Army, *Jour. A. Ph. A.*, 6 (1917), 1056.

² John L. Adams, *Bull. Pharm.*, 38 (1924), 17; *Year Book of the A. Ph. A.*, 13 (1924), 74.

³ A. Schamelhaut, *J. pharm. Belg.*, 8 (1926), 1; through *Year Book of the A. Ph. A.*, 14 (1925), 30.

VISIT THE CENTURY OF PROGRESS.

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