



DEPARTMENT OF THE TREASURY  
ALCOHOL AND TOBACCO TAX AND TRADE BUREAU  
SCIENTIFIC SERVICES DIVISION  
WASHINGTON, DC 20220

**OFFICIAL METHOD — SSD:TM:407**

**Carbohydrates in High Solids Distilled Spirits**

**Scope and Application**

This method is used to determine the carbohydrate content of distilled spirits containing solids more than 0.6g/100mL. TTB Procedure 2004–1 requires that all Alcohol Facts Labels include a statement of average analysis for calories, fat, carbohydrate, and protein.

This method is designed to determine the total carbohydrate by difference as set forth in the FDA food nutrition labeling regulation at 21 CFR 101.9(c)(6), which reads in part: "Total carbohydrate content shall be calculated by subtraction of the sum of the crude protein, total fat, moisture, and ash from the total weight of the food. This calculation method is described in A. L. Merrill and B. K. Watt, "Energy Value of Foods—Basis and Derivation," USDA Handbook 74 \* \* \*." (See the "References" section below for a link to this handbook).

For alcohol beverage products, moisture is the principle component by weight. Because the solids content is typically only a few percent, a small error in the moisture determination would result in a large error in the carbohydrate calculation. The presence of alcohol within the liquid fraction causes additional complications. Therefore, it is better to rearrange the above equation to state:

$$\text{Total carbohydrate by difference} = \text{total solids} - \text{protein} - \text{fat} - \text{ash}.$$

For high solids distilled spirits the total solids may include added sugar, citric acid, extracts, colors, and other Carbon/Hydrogen/Oxygen compounds. For most products under the scope of this method, fat and protein are not expected. However, cream liqueurs may contain milk and/or egg products, and so might contain fat and protein.

Regulatory Tolerances

The tolerance limits established by TTB Procedure 2004-1 are as follows:

The statements of carbohydrate and fat content on labels or in advertisements for alcohol beverages will be considered acceptable as long as the carbohydrate and fat content, as determined by TTB analysis, are each within a reasonable range below the labeled or advertised amount (within good

manufacturing practice limitations) but must not be more than 20% above the labeled or advertised amount.

For products labeled as containing more than 5 g/serving of carbohydrate, TTB defines a “reasonable” amount below the labeled amount of carbohydrates as no more than 20% below the labeled amount. For products labeled as having 4.9 g of carbohydrates per serving or less, TTB defines a “reasonable” amount as up to 1 gram per serving below the labeled amount.

### **Equipment**

The equipment required is determined by the methods used to determine fat, extract, ash, and protein content.

### **Reagents, Sample Preparation and Handling**

The reagents, sample preparation, and handling required are determined by the methods used to determine fat, extract, ash, and protein content.

### **Procedures**

1. Determine the specific gravity of the distilled spirit product using a digital density meter as outlined in AOAC 982.10.
2. Distill the product and determine the specific gravity of the distillate as outlined in AOAC 982.10.
3. Determine the ash using AOAC OMA 920.48 in units of g/100mL.
4. If necessary, determine the protein in the sample using TTB Official Method SSD:TM:506 in units of g/100mL.
5. There is no current TTB Official Method for fat in distilled spirits. Until a method has been put in place, use the value on the label as an estimate of fat content.

### **Quality Control**

The quality control measures required are determined by the methods used to determine fat, extract, ash, and protein content.

### **Calculations**

Total solids:

Calculate  $S = SGP - SGD$ .

Where: SGP = specific gravity of the product; and  
SGD = specific gravity of the distillate.

Total solids g/100 mL =  $SGP \times (187S^3 - 229.8S^2 + 259.17S - 0.0061)$ .

#### Carbohydrates:

Carbohydrate g/1.5 oz serving = 0.44 x (total solids – ash).

Where: 1.5 oz serving = 44 mL.

**NOTE:** If protein is detected or fat is claimed, substitute the following equation:

Carbohydrate g/1.5 oz serving = .44 x (solids – ash – protein - fat).

### Reporting Results

Report carbohydrates to one decimal place, i.e. XXX/1.5 fl.oz.

### Safety Notes

None.

### References

- TTB Procedure 2004–1.
- ATF Ruling 80–3.
- 21 CFR 101.9.
- A. L. Merrill and B. K. Watt, “Energy Value of Foods—Basis and Derivation,” USDA Handbook 74; (Available online at: <http://www.nal.usda.gov/fnic/foodcomp/Data/Classics/ah74.pdf>).
- Official Methods of Analysis, 17<sup>th</sup> Edition, 2002; Horowitz; AOAC International, Maryland.
- Ruppert, J.R., JAOAC, v. 69 no. 4, 1986, pp. 709-711.