FAT BEST PRACTICES GUIDELINES

AAFCO's Laboratory Methods & Services Committee

Fat Best Practices Working Group

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These guidelines are intended to assist analysts in the selection of appropriate methods to determine crude fat in various feed matrixes. These guidelines should be used in conjunction with the Fat Methods Scope & Matrix Table. The fat analyst and lab and/or section director should also become familiar with the Crude Fat Methods Considerations paper.

<u>These points need to be kept in mind when selecting the appropriate fat method.</u>

- Any method that is not being used within its scope should be validated for the extension of the scope prior to use of the method.
- Conducting a fatty acid profile and summing of the fatty acids to yield total fat is the ultimate way to evaluate the effectiveness of a fat method on a particular matrix.
- The method used to determine crude fat should always be reported.
- There needs to be communication between the lab and the client regarding the appropriate fat method.

The methods cited below would be appropriate methods to use with those matrixes. But it does not mean that it is the only method that can used. Modifications of these methods such as a different extractor (Soxtec vs. Soxhlet vs. Goldfisch vs. Ankom) may be employed as long as the modification has been validated. Other methods besides those that are cited may also be used as long as the method is validated.

<u>DRY FEEDS, PELLETED FEEDS, BLOCK FEEDS (non-molasses)</u>

Default method is ether extract such as AOAC 2003.05 (Randall submersion) or AOAC 920.39 (ether extract) or AOCS Am 5-04 (Ankom)

If the feed contains urea or >5% of water-soluble materials such as glycerol, or mono- or di- saccharides, or other soluble carbohydrates, conduct a water pre-extraction prior to the ether extraction. (see AOAC 920.39C)

If the feed has been heat-treated (baked, expanded and/or extruded), then analyze by an acid hydrolysis method such as AOAC 954.02

If the feed contains calcium salts of fatty acids (dairy bypass fats), then analyze by an acid hydrolysis method.

<u>FEEDS CONTAINING DRIED MILK, WHEY, CHEESE, CASEIN or OTHER DAIRY PRODUCTS; MILK REPLACERs</u>

Use appropriate base hydrolysis method such as AOAC 932.02 (dried milk products) or 932.06 (milk powder)

<u>**FISH**MEAL or FEEDS CONTAINING FISHMEAL</u>

Use appropriate acid hydrolysis method such as AOAC 948.04 (fish meal) or AOAC 948.16 (acetone extraction/acid hydrolysis)

FEEDS CONTAINING MOLASSES

If the feed is molasses coated, such as a texturized feed, either

Conduct a water pre-extraction prior to ether extraction such as AOAC 954.02C

Use appropriate base hydrolysis method such as AOAC 920.177 (confectionary)

If the feed is a molasses block or contains a high sugar level, use appropriate base hydrolysis method such as AOAC 920.177 (confectionary)

LIQUID FEEDS

Use appropriate base hydrolysis method such as AOAC 920.177 (confectionary)

PET FOODS, DRY

Use appropriate acid hydrolysis method such as AOAC 954.02

PET FOODS, CANNED

Use appropriate acid hydrolysis method such as AOAC 954.02

PET FOODS, SEMI-MOIST

Use appropriate acid hydrolysis method such as AOAC 954.02

DISTILLERS GRAINS

Use appropriate ether extraction method such as JAOAOC Vol 92 No 1, 2009, p 61 which recommends using petroleum ether instead of diethyl ether.

GRAINS, CORN & BIRDSEED

Use appropriate ether extraction method such as AOAC 2003.05 (Randall submersion) or AOAC 920.39 (ether extract) or AOCS Am 5-04 (Ankom)

SOYBEANS & SOY MEAL

Use appropriate AOCS (American Oil Chemists Society) ether extraction method such AOCS Ac3-44 (ether extraction) or AOCS Am 5-04 (Ankom)

OILSEEDS

Use appropriate AOCS (American Oil Chemists Society) ether extraction method such AOCS Am2-93 (double or triple extraction) or AOCS Am 5-04 (Ankom)

According to AOCS some oilseeds such as cottonseed (AOCS Aa4-38), flaxseed (AOCS Af3-54), safflower(AOCS Ag1-65) and sunflowers (AOCS Ai3-75) require either a double or triple extraction to achieve complete fat removal.

FORAGES (HAYS, SILAGES, HAYLAGES, PLANTS)

Use appropriate ether extraction method such as AOAC 2003.05 (Randall submersion) or AOAC 920.39 (ether extract) or AOCS Am 5-04 (Ankom)