ADPI Analytical Method #001
Sampling Dry Powders

1.0 Purpose

This Analytical Method defines the ADPI standard operating procedure for obtaining representative samples of dairy powders, whether for purposes of subsequent laboratory testing, evaluation against USDA grading standards, shipping to another location, or for other purposes where a representative sample is needed.

2.0 Scope

This SOP is applicable to sampling of dry powder dairy products of all kinds.

3.0 Definitions

3.1 A **sample** is a small portion of a larger quantity of material, intended to represent the characteristics of that larger quantity, and usually subjected to evaluation or testing.

3.2 A **composite sample** (or simply "composite") is one that is produced by combining two or more samples. Composites have the benefit of reducing the number of samples that require evaluation, but they also have the effect of reducing sensitivity to the characteristics and variability of the individual samples from which they are made.

3.3 A **trier** (sometimes called a "thief") is a type of sampler which is designed to aid in obtaining samples of material from containers, bags, bins, silos, etc. Triers for use in sampling food products are usually constructed of durable, cleanable materials suitable for direct contact with food, such as stainless steel, so that they may be adequately cleaned and sanitized between uses to avoid contamination and cross-contamination.

4.0 Principle

Systematic sampling procedures ensure that the samples themselves are representative of the larger quantity, and that the act of obtaining the samples is not deleterious to / does not alter their composition or other characteristics.

5.0 Reagents and Materials

Specific materials used for sampling are not necessary, provided that they are of suitable design and construction for direct contact with food. They should be constructed of durable materials, adequately sanitary or sterile in nature where appropriate, and if intended to be reused, should be cleanable.

Example materials suitable for use in sampling include, but are not necessarily limited to:

5.1 Gloves, powder-free, sterile where necessary;

5.2 Sample triers, stainless steel or similar;

5.3 Spoons, stainless steel or similar;

5.4 Spatulas, stainless steel or similar, or disposable;

5.5 Bowls, stainless steel or similar, of adequate size for sample compositing purposes;

5.6 Sample containers, flexible polyolefin or similar, e.g. Whirl-Pak®, of adequate size for holding samples or composites, and sterile where necessary;

5.7 Materials for closing / re-sealing sampled containers of material; consult your facility sampling procedures or your quality / food safety supervisor to identify appropriate materials;

5.8 Materials for labeling sample containers, such as adhesive labels, ink pens, permanent markers, or similar; where the use of such labeling materials will not compromise the samples themselves.

6.0 Personal Safety Precautions

In all cases, the practitioner company's internal policies and procedures regarding personal safety supersede the following ADPI recommendations:

6.1 Milk (dairy) is globally classified as an allergen and should be properly handled with personal safety needs in mind.

6.2 Dairy ingredients are foods and as such are exempt from U.S. requirements regarding Safety Data Sheets (SDSs), where ingredient-specific safe handling instructions would be provided. Despite this exemption, many dairy ingredients are manufactured and marketed in powder form, and powders should be recognized as potential physical irritants, such as to the eyes, nose, and if inhaled.

6.3 Sampling sometimes requires an unspecified sharp tool e.g., knife, box cutter, scissors, to facilitate the procedure. Be mindful of these hazards when present, and if facility policy does not require additional precautions, consider utilizing durable gloves for additional protection against cuts or scratches.

6.4 Sampling sometimes requires lifting heavy bags or boxes, moving bulk package configurations such as totes, and so on. Use proper lifting and moving techniques.

6.5 Sampling is often conducted in operational environments such as production areas and warehouses. Be mindful of the personal safety hazards that may exist in such areas, such as moving equipment, stored energy, vehicle traffic, and so on.

6.6 If bowls, similar vessels, or other elective apparatus used in the procedure are susceptible to breakage, be aware of personal risks associated with breakage. Inspect apparatus before use and replace any items which are compromised from this personal safety viewpoint.

7.0 General Procedural Considerations

Wherever applicable, consider any of the following when obtaining samples:

7.1 In order to ensure reliability of grading analysis, or any other evaluation, it is imperative that the sample be well mixed for uniformity. If the sample completely fills its container, or if a composite sample is desired, transfer the material to a larger, clean, dry, sterile (where necessary) container of ample size, to permit mixing with a dry spoon or other suitable utensil or by other appropriate agitation.

7.2 Avoid undue exposure of material to the air, which might cause contamination or moisture absorption.

7.3 When a large quantity of dry powder is to be sampled, it is recommended that for every 4,000 pounds of product, or any fraction thereof, a minimum of one (1) sample should be taken. After determining the total number of samples to be taken, each sample should be taken from units uniformly distributed throughout the lot or batch in question.

7.4 Dry dairy ingredients may readily absorb moisture and take on foreign odors when exposed to them for even short periods of time. It is important that conditions of sampling prevent absorption of moisture and foreign odors.

7.5 Samples and materials should be protected against dust or other contamination.

7.6 Sampling should be done in clean, dry surroundings, free from dust and foreign odors.

7.7 Do not sample in a humid atmosphere, in a damp, cold storage room, or in a room into which steam is being discharged.

7.8 Do not sample unless hands and clothes are clean and dry. Use of gloves is preferred.

7.9 Do not sample when attention is being distracted by other duties.

7.10 All sample containers and utensils used in sampling must be clean, sterile (where appropriate), dry, and at room temperature.

7.11 When samples will be used for microbiological analysis or for human consumption, sterile containers shall be used.

8.0 Sampling Procedure

8.1 Select an appropriate sampling utensil, such as a trier, spoon, spatula, or other.

8.2 Plunge the utensil down through the center of the opened material container, at least 6” from any surface, and withdraw the sample. Make note of color uniformity and particle characteristics from the visible sample.

8.3 Repeat 8.2 as necessary until the required amount of total sample is obtained.

8.4 Immediately close / reseal the original material container or vessel immediately on completion of sampling.

8.5 Immediately close / seal the sample container, either blending the contents before closing or by mixing afterwards, as appropriate.

8.6 Label the sample container with appropriate identification information.

8.7 Take care to avoid damage to the sample container during transport or shipping, such as by packing in corrugated cartons, using paper or foam packing, “bubble wrap” and similar.

9.0 Compositing Procedure

9.1 Obtain samples as described in 7.0 Sampling Procedure above, making sure that each individual sample is not less than four (4) ounces (100 grams).

9.2 Combine not more than six (6) individual samples to make a composite.

9.3 Combine the individual samples in a suitable container sufficiently large to facilitate thorough blending / mixing.

9.4 Turn over the contents of the container with a dry spoon or other suitable utensil by lifting from the lowest edge of the container, at the same time rotating the container while it is tipped at an angle of 45 degrees.

9.5 Mix in this manner for a period of not less than one (1) minute.

9.6 Avoid absorption of moisture and contamination from dust during this process.

9.7 Transfer the composite sample into a suitable container.

9.8 Label the composite sample container with appropriate identification information.

9.9 Take care to avoid damage to the composite sample container during transport or shipping, such as by packing in corrugated cartons, using paper or foam packing, “bubble wrap” and similar.

10.0 External References

No external references are made here.

11.0 ADPI Document Linkages

No linkages to other ADPI documents are made here, but note that any samples or composite samples taken for purposes of evaluation / analysis by other ADPI Analytical Methods should be taken according to this procedure.

12.0 Revision History

Version	Effective Date	Notes
1.0	???	First officially approved version of this Standard Operating Procedure.
2.0	08/08/2023	Migrated this analytical method to the new modernized Standard Operating Procedure format as established by the ADPI Vice President of Technical Services.