Explanation Feed Monitoring

Sampling and Retained Samples

1 Aim of sampling

The aim of sampling is to take a feed sample which represent the average characteristics of the entire lot in terms of its properties and composition.

Only proper, carefully conducted sampling can be the basis of a reliable test result during self-assessment. Correct and meticulous sampling is therefore essential. This supporting document serves as a support for the formation of laboratory samples and retained samples. Sample photos of the accessories mentioned in the text, which are also intended as sampling support can be found at the end of the document (chapter: Enclosures).

2 2 Terminology

- **Lot:** A quantity of feed that forms a unit and of which it is assumed that it has uniform characteristics.
- **Individual sample:** A quantity drawn from one place in a lot. Individual samples should be of equal size and taken at random over the entire lot.
- **Collective sample:** Homogenised total quantity of individual samples taken from one lot.
- **Reduced collective sample:** Sub-quantity (approx. 2-3 kg) of the collective sample obtained from the latter by representative reduction of the sample mass. .
- **Final sample:** Sub-quantity of the reduced collective sample or homogenised collective sample; a final sample (min. 500 g) is submitted for analysis while one or two other final samples are kept on the premises as **retained samples** to guarantee traceability (e.g. in the event of complaints).

3 What should be observed during sampling and shipping?

The following measures are recommended to obtain a representative sample:

Sampler:

- The sample must be taken by a qualified person who is trained and experienced in the sampling of feed and who takes appropriate care when taking the sample. If the necessary knowledge cannot be conveyed in internal training, the sampler should participate in external training. If this cannot be guaranteed within a company, an external sampler should be commissioned (e.g. from a laboratory).
- To avoid contamination when sampling, it should be ensured that samplers wear clean clothing and observe hygiene measures when sampling. This includes appropriate hand hygiene (e.g. washing hands immediately before sampling) and/or wearing clean gloves.
- When using automatic sample drawing equipment, sampling should be monitored and con-trolled by a trained person. The presence of the sampler is always required at the beginning and end of sampling (opening/closing of sample container).

Sampling:

- As sampling has a decisive influence on the analysis result. Therefore it must be carried out in such a way that the final samples represent the entire lot as precisely as possible. To ensure this, the method of sampling must be adapted to the size, properties and composition of the lot, as well as the parameters to be examined. It must be taken into account that an undesirable or prohibited substance may be unevenly distributed in a lot (nest formation, e.g. aflatoxin B1). Here, faulty sampling can easily lead to a result that is not representative for the lot. Where ingredients or substances can be unevenly distributed in feed, sampling in accordance with **Regulation (EU) No. 691/2013** is recommended.
- External influences have to be considered during sampling. Contamination of samples with dust etc, or due to unsuitable weather conditions (e.g. rain) should be avoided.
- The combining of individual samples into one homogenous collective sample and the subsequent formation of final samples must also be done under hygienic conditions and in a suit-able place (clean

and free of contamination) using suitable accessories (e.g. sample separators). Final samples must be as homogeneous as possible.

- The time of sampling on feed producers' premises also plays a decisive role. To obtain a representative sample at a compound feed plant, it is necessary to draw the sample from the flowing product stream during production. With pelletised compound feeds, the sample should be drawn at the inflow to the finished goods cell. With pulverised and liquid com-pound feeds, the sample should be drawn after the process stage in which all recipe ingredients have been measured out and mixed in. After completion of the production process, possible further influences on the quality (e.g. through storage) must be considered on a HACCP basis. This may require further sampling
- Samples should be taken at different points and at different depths in bulk freight hoppers and spread as far as possible over the entire cargo area. Use of a sample insertion device or rod is recommended.
- Where samples were taken from sacks or Big Bags, the puncture points must be resealed. Particularly strong adhesive labels or tape which can be written on and stick to uneven sur-faces should be used for this purpose.

Sample quantity

- Sufficient sample material has to be drawn for proper analysis. To ensure that all commissioned parameters can be examined, the minimum size of the final sample must be dimensioned accordingly. It must also be taken into account that a second analysis from the same sample has to be conducted if a result is rejected and that additional retained samples have to be drawn at the same time as the final sample. These are for the business's own protetion as they can help with the investigation of customer complaints. It should also be considered that sufficient material must be retained for possible checks by the authorities (see Annex II, Quality Control section of feed hygiene regulation **Reg. (EC) No. 183/2005**). Accordingly, the recommended sample quantity per final sample should be at least 500 g or 500 ml. If necessary, the laboratory should be consulted to establish which sample quantity is required for the planned analyses.
- It is important to keep the individual lots strictly separate from one another and to form separate reference samples for each lot (no average samples from different lots). The gen-eral rule here is the smaller the lot used for sampling, the fewer goods have to be rejected in the event of contamination and the easier it is to trace the source and find the cause.

Sampling equipment containers:

- The sampling equipment used (buckets, shovels, scoops, insertion devices) must be made of materials which cannot contaminate the feed to be sampled. Equipment intended for multiple use must be easy to clean in order to avoid cross-contamination. Accordingly, equipment should be thoroughly cleaned (and disinfected if necessary) before use or as of-ten as possible. In addition to this, equipment should be stored in such a way (in a firm, dry and clean place)that contamination can be prevented.
- Special case: sterile sampling (with qualitative microbial testing, e.g. Salmonella):
  - Thermal sterilisation (stainless steel devices) or chemical disinfection (weighing equip-ment) must be carried out before using sampling equipment.
- Choosing a suitable container (e.g. sample bag) for the representative final sample and retained sample is also of decisive importance. The container must be clean and suitable for keeping the sample hygienically in such a way that its properties and quality are not al-tered. It must also be ensured that it is not possible to open and reclose the container un-noticed prior to analysis in the laboratory. Containers must be sealed for this reason.
- The sample shall be labelled in such a way that its traceability and identification is always guaranteed.

Sample shipment:

- Once a sample has been drawn, it should be transported or shipped to a laboratory as quickly as possible. Care should be taken here to ensure that the sample is not affected by any external factors, such as sunlight or moisture. The form of transport should be appro-priate to the sample material (e.g. sufficient cooling when necessary).
- Special case: qualitative microbial testing (e.g. Salmonella):
  - The sample must be kept cool during transport (Salmonella die off at temperatures of over 60°C over a period of more than half an hour).
- If the sample is to be analysed for QS feed monitoring, the following must be observed:
  - If a lot is to be examined within the scope of QS feed monitoring, the sample-related data should be entered in the database and the laboratory commissioned via the data-base. The accompanying certificate can be printed out directly from the database and should be enclosed

with the sample when shipped. It should list all of the relevant data. In this way, the laboratory can recognise immediately that it is a QS sample the results of which have to be entered in the database.

4 Keeping of retained samples

Retained samples must be sealed and kept in compliance with the perishability of the product (e.g. refrigeration, freezing). The length of time for which retained samples should be kept depends on the durability of the product.

Note: *It is no longer possible to detect yeasts and moulds from a frozen sample.*

5 Further documentation

Feed monitoring guideline

European and national laws and ordinance

All laws and regulations apply as amended, i.e. including updates and amendments. Several of the mentioned laws and regulations are linked to the homepage of the Federal Ministry of Food and Agriculture (BMEL):

http://www.bmel.de/DE/Tier/Tierernaehrung/_texte/FuttermittelGesetzeVerordnungen.html

- Regulation (EU) No. 691/2013
- Annex II, Quality Control section of Regulation (EC) No. 183/2005

6 Enclosures (photos)

- Sample container (bucket):

Clean, free of aromas, with a smooth surface, easy to clean.

- Hand shovel/long shaft shovel:

Used to draw an individual sample from a moving flow (e.g. elevator) or dumped load (e.g. from a truck).

- Sampling rod (compartmentalised spear) with one or more compartments/chambers:

Used for pre-sampling of grain from transport vehicles (e.g. trucks) or in storage. The sampling rod should always be adjusted to the depth of the products in the vehicle/storage area.

- Dipper:

The dipper is typically used for the sampling of liquid feeds. It is also used for drawing samples from hoppers or trucks and for the pre-sampling of ship cargoes if there are no other available options (e.g. automatic sampling equipment).

- Collective sample:
- Special case: qualitative microbial testing (e.g. Salmonella):
  - The hygienic conditions must be maintained, even during homogenisation and reduction, e.g. by laying out (brand) new film.

The individual samples (number representative of the tonnage of the entire lot) are combined into a collective sample which has to be homogenised, with lumps being pulverised if necessary.

This can be done in a plastic basin.

If the collective sample has to be reduced, this should be done with the help of the sample divider.

- Final/laboratory sample or retained sample: