Seminar on Grain Inspection, Sampling and Fumigation: Best Practices

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SAMPLING AND INSPECTION
GAFTA124, FOSFA, ISO24333

LOADING and DISCHARGE: Bulk shipments.
REPRESENTATIVE SAMPLE:

Most suitable sampling equipment
Number of samples and increments taken
Points from where samples are taken
Mixing of samples
Packing, labelling, storage
PART #1.1:

SAMPLING POINTS.
SAMPLING METHODS.
EQUIPMENT.
Sampling points/ methods at LOADING

- By **Ellis cup** from conveyor belt from moving stream, when cargo is loaded by conveyor belt into vessel’s holds;

- By **2m probe** or by **pelican** sampler from falling stream, when cargo is loaded via vehicle/container via special tray into vessel holds;

- By **pelican** from falling stream or **cone sampler** from holds, when cargo is loaded by container(s) or wagon(s) directly into vessel holds;

- By **2m hand probe** or **cone sampler** from the bulk, when cargo is loaded from quay or barge/river vessel by grab;

- Also, **automatic sampler** (established on a conveyor line) is used on a terminal equipped with such.
Sampling points/ methods at DISCHARGE

- By **Ellis cup** from conveyor belt from moving stream, when cargo is discharged by pneumatic equipment (vacuum) via conveyor belt into silo bins.

- By **1.5-2m samplers** from each truck according to ISO 24333 by grid method, when cargo is discharged by grabs via trucks into warehouse.

- By **probe** or **hand scoop** from warehouse is also practiced, where applicable. However, such samples could be considered as informative only.

- By automatic samples in case terminal equipped with such.
Manual Equipment

In general, basic principals of achievement of representative samples at both loading and discharging are:

• Sampling should be carried out when the products are flowing (e.g. during loading or unloading) - throughout, uniformly, systematically and concurrently with loading/ discharging so that all the parts of the lot have the same probability of being sampled.

• The methods of taking samples from flowing lots shall be adapted to the speed at which the products are flowing.

• The number of increments shall be as high as possible, but not less than stated in the corresponding Rules (will be reviewed further in part #1.2).

There are many different types of sampling equipment or devices. Most common are:

- ELLIS CUP
- PELICAN
- PROBE SAMPLERS

All equipment to be used for grains should be clean, dry and free from foreign odors.
Different methods of sampling
(uniformly and systematically)

Sampling by Ellis cup from conveyor belt

Sampling by hand probe from bulk

Sampling by pelican sampler
Automatic sampling particulars

Automatic sampler **from vehicles** is programmed for taking fixed quantity of samples/increments from each vehicle (min 3-5 increments).

Automatic sampler **for bulk loading**, this automatic sampling device forms an integral part with the loading equipment and makes periodic increments basis given settings (depending on loading rate).

At this we may **recommend** to follow the established automatic system, however constantly monitor the rate of loading/unloading and the equipment’s settings to be in line with each other.
NOTE:

The most suitable **equipment** should be chosen taking into the account the product to be sampled, the quantity required, the actual method of loading and sampling point(s).
NOTE:

It is important to note that only quality of total loaded vs total discharged consignment(s) - properly sampled at both ends according to Int’l Rules - to be compared.
PART #1.2:

INTERNATIONAL STANDARDS:
INCREMEN T SAMPLING.

CONTRACTUAL/ ARBITRATION SAMPLES.

International Rules to be discussed next are valid for both loading & discharge of bulk cargoes.
GAFTA  124

<table>
<thead>
<tr>
<th>Consignment size</th>
<th>Tonnes</th>
<th>0-5000</th>
<th>5001-10,000</th>
<th>10,001 - 25,000</th>
<th>&gt;25,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lot size</td>
<td>Tonnes</td>
<td>500</td>
<td>1000</td>
<td>2500</td>
<td>5000</td>
</tr>
<tr>
<td>No. of increments per lot</td>
<td>number</td>
<td>min 20</td>
<td>min 30</td>
<td>min 40</td>
<td>min 50</td>
</tr>
<tr>
<td>Min bulk aggregate sample per lot</td>
<td>Kilos</td>
<td>20</td>
<td>30</td>
<td>40</td>
<td>50</td>
</tr>
<tr>
<td>Max weight of increments</td>
<td>Kilos</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

**Contractual/ arbitration** samples should represent the whole contractual consignment. Weight of contractual sample is generally recommended at not less than 3kg; with exception of 10kg for Corn for GMO and Mycotoxins tests. Arbitration samples = not less than 3kg each.

Quantity of contractual samples = as many as Contract requires. Quantity of set of arbitration samples consists of 3 kg per each 5000 mt or part thereof and to be used in case of arbitration only.

All samples to be packed, labelled and sealed according to the Rules.
Contractual samples shall be representative of the lots from which they are taken. All (lot) samples are taken for analysis and/ or arbitration purposes. Weight of contractual/arbitration lot sample vary from 1 kg for small seeds to 2-5 kg for medium/ large seeds and 5 kg for copra.

Quantity of samples should not be less than prescribed in Contract - generally required 5 representative sets of (lot) samples.

All samples to be packed, labelled and sealed according to the Rules.
### ISO 24333/flowing

<table>
<thead>
<tr>
<th>Method</th>
<th>Range of mass of increment</th>
<th>Minimum number of increments&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Minimum mass of laboratory sample for contaminants</th>
<th>Minimum mass of laboratory sample for other analyses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mechanical sampling</td>
<td>300 g to 1,900 g</td>
<td>— 20 per lot or sub-lot of 500 t</td>
<td>1 kg to 3 kg according to analytical requirements</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>— 25 per lot or sub-lot of 1,500 t for large batches of size greater than 1,500 t</td>
<td>1 kg to 3 kg according to analytical requirements</td>
<td></td>
</tr>
<tr>
<td>Manual sampling</td>
<td>300 g to 1,900 g</td>
<td>For contaminants:</td>
<td>For ochratoxin A and aflatoxins: 10 kg</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>— 20 per lot or sub-lot of 500 t</td>
<td>For pesticides, heavy metals, dioxins: 1 kg</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>— 25 per lot or sub-lot of 1,500 t for large batches of size greater than 1,500 t</td>
<td>For other contaminants&lt;sup&gt;b&lt;/sup&gt;: 3 kg</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>For other analyses:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>— 3 per lot or sub-lot of 500 t</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>— 4 per lot or sub-lot of 1,500 t for large batches of size greater than 1,500 t</td>
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</tr>
</tbody>
</table>

<sup>a</sup> Frequency according to grain flow.

<sup>b</sup> Other contaminants like deoxynivalenol (DON), fumonisins, zearalenone; for the determination of DON, the mass of laboratory sample can be 1 kg.

Samples for **laboratory analysis/arbitration** should represent the whole contractual consignment. Weight of a sample is generally recommended 1 to 3 kg; with exception for other contaminants. Quantity of samples for laboratory analysis/arbitration = as many as Contract requires or shall be subject to an agreement between the parties concerned.

In the event of arbitration, samples shall be taken jointly by representatives of both the purchaser and the vendor, or by a third party nominated by common accord. All samples to be packed, labelled and sealed according to the Rules.
SAMPLING OF BULK CARGO IN STATIC

GAFTA 124 recommends that for sampling from wagons or vehicles at loading, the increment samples shall be taken by spear from not less than 3 sampling points from each wagon or vehicle. From static bulk cargo increment samples shall be taken uniformly and systematically, concurrently with discharge, at the nearest practicable point to the hold, preferably from a moving stream when discharging overside, or to silo, to barge/craft or other means of transport by ordinary hand scoop, spear, or by other mutually agreed equipment throughout loading/discharge.

FOSFA suggests that the increments should be taken by sampling at least 5 different positions according to the size of the lorry or wagon. When bulk material is sampled in holds during discharge, the increments shall be taken from as many places as possible, excluding the run, and at intervals determined by the rate of discharge.

ISO 24333 advises that for non-flowing commodities (static), particular care shall be taken to ensure that these increments are distributed regularly throughout the grain mass, both at the surface and deep down. The lot should be sampled over its entire depth using a grid method.

If the above is not complied, taken samples are considered as informative, but not representative of the whole consignment. Nevertheless, ALL international Standards state that sampling of bulk cargoes shall be from products in movement, which, generally, shall be preferred.
PART #2:

VISION OF BEST PRACTICE (SURVEYOR & AUTHORITIES). RECOMMENDATIONS.
VISION OF BEST PRACTICE (SURVEYOR & AUTHORITIES) - RECOMMENDATIONS.

- Collaboration to be maintained between surveyors and authorities;
- Sampling by authorities to be accompanied by the surveyors.
- Precautions shall be taken to guarantee the integrity of all samples during interim period between sampling and testing. Namely packing, labelling, sealing, etc. Samples preparation, mixing, labeling to be witnessed by surveyor.
- Numbered seals to be used vs lead seals.
- Appropriate sample containers to be used to allow proper sealing to avoid any contamination or change in their contents.
- Encourage participation in ring tests for various analysis (government and private laboratories).
- Quality discussions for the total shipment vs partial comparison (due to self-segregation of a bulk cargo during voyage as well as cargo natural damages during loading/ discharging/ transshipment and other manipulations the cargo undergoes).
PART #3:

SAMPLE’S PREPARATION. STORAGE. LABELLING. CONFIDENTIALITY.
Samples should be thoroughly mixed using dividers or manual quartering; well packed in rigid airtight and moisture-tight containers fitted with airtight and moisture-tight closures. The containers shall be completely filled and the closures shall be sealed.
SAMPLES LABELING AND STORAGE

LABEL: Each label shall bear at least the following information: (The information recorded on the label shall be permanent.) No client name should be indicated at the label.

1. ship or road vehicle  ________________ (coded)
2. from (date)  ________________
3. to (date)  ________________
4. date arrived  ________________
5. quantity  ________________
6. bulk/bags  ________________
7. goods  ________________
8. ID mark or lot number  ________________
9. #/date BL or contract  ________________
10. date of sampling  ________________
11. place and point of sampling  ________________
12. sampled by  ________________
13. name of organization responsible for terms of contract  ________________

STORAGE: Contractual/ arbitral samples are normally stored for 3 months from BL date (according to GAFTA) or as instructed by Principal.
Thank you!

Questions?

For any questions, please contact us:

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