Grain sampling – a farmer’s guide

Spring 2003
Dear member

In any supply chain, business must be based on understanding and meeting the needs of buyers. In the ‘grain chain’, farmers must forge links with merchants or end-users.

However, supplying grain to a specification is not easy. Grain is inherently variable and specifications become ever more stringent. Failure to meet specifications means farmers face price deductions or, in the worst case, rejection. We have calculated that the annual cost to the industry is around £2.5 million.

Much of this cost could be saved if the quality data obtained by both the seller and buyer of grain match each other well. Achieving this depends on adopting similar standards for grain sampling and accurate analysis on and off the farm.

That is why HGCA seized the opportunity to generate a greater understanding of sampling through the ‘Grain Sampling and Analysis Project’. Funded 75% with a HM Treasury ‘Invest to Save’ grant and with 25% HGCA input, this guide is one of the project’s first outputs.

The protocols included here do not replace international standards employed by sectors of the trade. However, the HGCA protocols, devised by the industry, represent a significant advance for practical farm use.

Yours sincerely

Professor Graham Jellis
Director of Research & Development
Know what you have harvested

Manage what you have stored

- prepare store
- cool grain
- dry grain
- monitor

Know what you have sold
Grain marketing

In a difficult marketplace, careful planning - based on known crop quality - helps to achieve budgeted price levels. An effective plan begins pre-drilling and tackles both marketing and price management.

### Before harvest

**Market planning begins**
- Find out what your local buyers want.
- Compare potential premiums against additional growing costs.
- Match the varieties you sow to local market needs where possible.
- Plan sales to manage risk and meet cashflow requirements.
- Consider fixing quality premiums on a proportion of the crop.

### At harvest

**Sampling and analysis**
- Determine your harvest quality based on representative samples and accurate analysis.

**Does grain meet the specification of target markets?**

**YES**
- Segregate by variety and quality to satisfy existing contracts first.
- Agree fallbacks with buyers before signing contracts in case things go wrong.

**NO**
- If concerned, seek less demanding markets.
- Don't sell on price alone - be confident you can meet the specifications.
- Agree fallbacks with buyers before signing contracts.

### Marketing on sample results

At harvest, quality is determined by accurate sampling and analysis. Grain is marketed to maximise any premiums by matching sample quality to the most appropriate buyer.

Top prices must be balanced against risk of rejection. Be cautious of sending variable quality grain to distant or demanding buyers. Agree allowance charges with buyers for grain below specification before signing contracts. Budget realistically for deductions and rejections.

### Pricing to meet objectives

Despite good sampling and analysis growers remain exposed to the underlying volatility of feed grain prices. All the effort of producing a premium grain crop for a £3/t premium can be wiped out by the underlying feed price falling £10/t. This reinforces the need for coherent price management.

Where storage can gain no other income, storing forward as far as possible may maximise returns. However, stored grain is exposed to price volatility. Selling forward, rather than relying on spot market prices, reduces risk. Alternatively, price insurance using grain options protects unpriced grain in store.
Sampling and analysis

Representative sampling and accurate analysis ensures that you know the quality of your harvested grain and that you sell it to the most appropriate buyers.

Use sample results to optimise returns

Representative samples, accurately analysed, form the basis of any sales campaign. Results allow grain to be segregated by quality and variety. Producers can match grain batches to buyers’ specific needs.

Each year poor sampling and analysis cost the industry around £2.5 million

Failure to market the right specification of grain results in loss of quality premiums, additional haulage and administration charges. These costs have risen sharply compared to the grain price and can make the difference between profit and loss.

Checks on quality

Farmers are an essential link in the ‘grain chain’ that, at each stage, increasingly demands evidence of quality control. There are several components.

Assurance schemes

Many buyers demand traceability. Membership of schemes – such as Assured Combinable Crops Scheme (ACCS), Farm Assured British Beef and Lamb (FABBL), Genesis QA and Scottish Quality Cereals (SQC) – provides this.

Feed compounders belonging to the UKASTA Feed Assurance Scheme (UFAS) require that all grain they use must come from assured farms, with Grain Passports accompanying all deliveries. Most end-users also require the relevant harvest year sticker.

Intake tests

Basic quality parameters are tested at intake. To achieve efficient turn-around of lorries, results have to be available within 20-30 minutes. Rapid secondary methods are preferred to more time-consuming primary tests.

 Buyers depend on specialised equipment for secondary tests. For example, millers use several tests based on near infrared reflectance or transmittance (NIR or NIT) with ground or whole grain respectively.

Calibration, the relationship between results from primary and secondary methods, is established by reference testing hundreds of samples and regular performance checks.

Quality control at intake

Assuming that representative samples are taken, tests must achieve high, reproducible standards. Training and competency checks aim to minimise inaccuracies caused by operator, equipment or reagents. Well-documented, validated methods are used with control samples to monitor day-to-day performance.

ACTION:

- Sample grain correctly.
- Sell on the basis of sampling and analysis results, not just on price.
- Make the most of existing stores by selling grain forward before storage.
Milling wheat - quality criteria and tests

While almost any wheat can be milled, millers produce a wide range of flours with specifications tightly defined by bakers for each product.

Millers analyse and then segregate each batch of wheat to meet the quality their customers require for each grist or blend.

Moisture content
Wheat quality is threatened when the moisture content of stored grain exceeds 15%. There is a risk of infestation and mould as well as mycotoxin formation, all of which can lead to rejection.

Specific weight
Thin, shrivelled grain will not mill to produce adequate amounts of clean, white flour.

The specific weight test measures the weight of grain – in kilogrammes – that can be packed into a cylinder of fixed volume, normally 1 litre.

Screenings and admixture
Screenings are undersized grains and admixture comprises impurities, e.g. chaff, weed seeds and earth, which must be removed before milling marketable flour. Screenings and admixture represent a loss to the miller, so a maximum of 2% is normally allowed.

Screenings and admixture are measured using standard slotted 3.5 mm and 2 mm sieves.

Variety
Wheat varieties are categorised by nabim Groups 1 to 4. Groups 1 and 2 are used for most breadmaking grists while Group 3 is used for a range of biscuit, cake and batter flours.

Protein content
Protein content is specified for all bakery flours and is a key part of the contract. For most breadmaking flour, wheat with a protein content above 13% dry matter, is preferred. If protein content cannot be achieved using home-grown wheat, imported high protein wheat or wheat gluten can be added in. For most biscuits and cakes, gluten formation is not required and much lower protein flours may be used.

Protein quality
When wetted, during dough making, some of the proteins in wheat flour form a visco-elastic substance – gluten. This can hold gas produced during fermentation and supports the starch and bran producing a typical well-risen UK loaf.

The amount and quality of gluten produced indicates potential performance. No fixed threshold exists.
Hagberg Falling Number
Low Hagberg indicates high enzyme activity and onset of sprouting. A threshold of 25 seconds is used for breadmaking wheat and samples with low Hagberg are rejected. Low Hagberg wheat produces bread with a dark crust colour and a weak, sticky crumb that cannot be sliced.

The Hagberg test is used worldwide. It measures the time, in seconds, a plunger takes to descend through a heated mixture of ground grain and water. The test provides an indirect estimate of alpha-activity.

Moulds, damaged grain and odours
Visual examination assesses grain for moulds, Fusarium (pink grains) and particularly ergot. Checks are made for live insects and grain damaged by insects. Experienced staff also assess grain for unusual odours. “Mustiness” or “chemical” odours indicate storage problems. Individual companies set their own criteria for these assessments.

Grain hardness
Grain hardness is a key variety trait for milling. Hard and soft wheats have different processing requirements and end-uses. The hard wheats used for breadmaking must absorb sufficient water during dough making. Soft wheats are preferred for biscuits as much added liquid is baked out to produce a crisp product.

By crushing individual grains within a Single Kernel Characterisation System (SKCS) instrument, the miller can check grain hardness and identify mixtures of hard and soft varieties. Near infrared calibrations, based on SKCS, can rapidly separate hard and soft wheat samples.

Visit the nabim website at www.nabim.org.uk

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Maltsters use barley of different specifications to produce a range of malts. For growers, key characteristics are variety and the range of grain nitrogen percentage.

Maltsters test barley before purchase to assess suitability. Most tests are carried out at intake to ensure loads match the quality criteria.

**Moisture content**

Above 14% moisture content, grain cannot be safely stored, while above 15% price adjustments based on moisture content alone may be triggered. UK maltsters usually dry to 12% for long-term storage, but make no drying charge to suppliers below 19% moisture content.

**Grain size, screenings and admixture**

Barley is screened before processing to remove small grains, which will not process properly and give fermentable sugars.

A series of sieves is used to determine the grain size of each load.

Screenings are undersized grains and impurities, eg chaff and weed seeds, which must be removed before malting. Screenings represent a loss to the maltster, so a maximum figure is specified by the buyer.

Undersized grains and impurities are measured using standard slotted sieves of 2.5 mm and 2.25 mm. Admixture is a contamination (eg stones, dirt and foreign bodies) and a buyer typically allows a 2% maximum. The grain buyer will define the standard used in the grain contract.

**Grain damage**

Kernels damaged, by skinning or splitting for example, will allow nutrients to leak out during malting. This encourages infection and leads to poor extract yields.

Insect damage will impair both viability and extract yield. It also encourages mould infection during storage.

**Variety**

Maltsters require specific varieties suitable for their customers. Trained staff can identify grain by variety using visual inspection. In cases of doubt, laboratory testing of protein or DNA “fingerprints” can be used.

**Viability**

Malting depends on grain germinating under controlled conditions, so grain must be fully viable. The threshold viability for acceptance is a minimum of 98% germination.
Maltsters use a staining test. This rapidly measures viability (known as germinative capacity) and indicates pre-germinated grains.

Grain that fails to germinate does not produce enzymes during malting. The resultant malt causes processing problems. It reduces brewery or distillery throughput and gives poor quality, cloudy beers.

Pre-germinated grains can die during steeping (the first stage of malting) or lead to mould growth in malting, both of which cause problems in brewery or distillery.

### Important parameters

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<th>Buyer response</th>
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<td>Moisture content</td>
<td>yes</td>
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<tr>
<td>Mould, discolouration and food safety</td>
<td>no</td>
<td>yes</td>
<td>rejection</td>
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### Nitrogen

Excessive protein content can impair processing in maltings and breweries. Protein replaces starch within grain and reduces alcohol yield. However, some protein is necessary for yeast growth and beer foam.

Protein is measured by assessing the total nitrogen (TN) content of grain. Testing mainly uses the Dumas method, which has replaced Kjeldahl. Rapid assessments can also be made using near-infrared spectroscopy. All give results accurate to +/- 0.05%.

### Typical specifications

- Most brewers require a TN of 1.55-1.85%.
- Distillers with pot stills and traditional ale brewers may need even lower N.
- Some brewers of export lager, using starch-rich adjuncts, require a TN of 1.8-1.85%.

### Mould, discolouration and food safety

Grain can be discoloured by “weathering”, or mould infection, which can depress viability and lead to contamination with toxins.

Any mould or “nose” will result in rejection.

Malting barley must comply with legal limits for contaminants in food products. The Grain Passport is an important safeguard. Maltsters check random samples for pesticides, while regular surveys check for other contaminants, e.g. mycotoxins and lead.

Visit the MAGB web site at www.ukmalt.com
Wheat and barley are the main cereals used for animal feeds. Feed compounders are becoming increasingly discerning about the cereals they seek. While the aim is to purchase grain of high nutritional value, there are no definitive intake tests at present.

The industry also seeks grain that is fresh and clean - important to satisfy codes of practice with respect to Salmonella and due diligence. It must be safe to store in the feed mill.

Most intake tests apply to all grains for all livestock species.

**Moisture content**

Grain moisture content is always measured on intake. Many feed merchants regard it as the most important assessment. It is seen as a very good indicator of quality for animal feeding. High moisture content may indicate poor storage and possible future problems, such as mould growth or sprouting which may impair quality.

Grain, which is received above 15% maximum moisture content, may be rejected.

**Specific weight**

Although quick and easy, the relevance of this test as an indicator of grain quality for livestock is debatable. However, the industry has many years' experience and continues to use it. More suitable indicators are needed.

Grain contracts set out required specific weight. Typical industry standards are 72 kg/hl for wheat and 63 kg/hl for barley. Grain failing to meet specific standards is usually rejected, although some companies operate allowance schemes.

**Moulds, admixtures and odours**

Initially, grain is assessed for moulds, Fusarium (pink grains) and, particularly,
Grain is also assessed for unusual odours by experienced staff and by comparison with untainted grain. Smells such as “mustiness” and “chemical” indicate storage problems.

Individual companies set their own standards for qualitative tests. Tolerances may vary according to the mill’s specific requirements.

### Food safety

Feed grains must comply with legal limits for contaminants in food products. The Grain Passport is an important safeguard.

### Chemical analysis

Although not conducted at intake, chemical analysis of grain allows feed compounders to adjust raw material matrices. Such analysis is not normally relevant to grain producers.

Protein, fibre and ash are, by law, declared on compound feeds. Therefore, feed compounders need to know the contents of these constituents in raw materials.

Whilst protein, calculated from nitrogen content, is important for suppliers of animal feed, a contract figure is rarely imposed on grain suppliers.
The sampling process

OPTION 1: ON-FLOOR DRYING

HARVEST

PREPARATION
Have all the equipment necessary for sampling - sample bags, boxes, record sheets, spears etc - ready before harvest commences.

SAMPLING – EX-TRAILER
(Take at least one sample from each trailer)
Sample flow with pelican sampler.
or
Spear at least three samples from the tipped heap.

OPTION 2: HIGH TEMPERATURE DRYING

HARVEST

Key:
A1 Grain loads
S1 Samples taken
**SAMPLING - EX-DRYER**
Sample grain. Measure moisture content frequently - re-dry if necessary.

**STORE with on-floor drying** - Composite sample represents identified loads in bulk or bin.

**COMPOSITE SAMPLE**
Blend individual sub-samples

**SUB-SAMPLE**
(to retain)

**SAMPLE**
(contains)

**COMPLETE RECORD**

**STORE**
Composite sample represents identified loads in bulk or bin.

**MEASURE MOISTURE CONTENT AND TEMPERATURE OF EACH SAMPLE**
Sampling equipment

1. Containers for composite samples

Use plastic tubs or boxes, at least 10 litre capacity with lids, kept specifically for sampling. Many retail outlets supply these at a modest cost. Self-adhesive labels for containers are useful.

2. Site plan

Draw up a clear plan of the grain storage site showing all areas used to store grain. Floor store plans should be divided into bays and each bay allocated a number and/or letter. Give each bin an identification number. Ideally, store each batch of 50 tonnes or less in an identifiable area.

3. Sample scoop

Use a litre plastic jug, obtainable from most kitchenware retailers, kept specifically for sampling.

4. Pelican sampler

This consists of a rectangular box with an open top. It can be easily constructed from wooden battens and 5 mm plywood, mounted on a 1.5 m handle.
5. Grain spear

Ideally use a modern, multi-aperture spear, at least 1.5 m long, capable of being opened and closed by the operator. Such spears are emptied through a single orifice, usually in the handle, into a container.

Spears that only take single samples must be inserted several times at different depths at each point to collect a proper sample. Take shallow samples first.

6. Diverter sampler

One way to sample grain ex-drier is to set up a simple “diverter sampler”. An angled, perforated tube is inserted into the grain flow to bleed off a steady stream of grain. Set perforations at an angle to grain flow to avoid clogging. Rotating the tube adjusts the flow of grain sample.

7. Bags for merchant samples

Use new plastic bags of at least 1kg capacity. Self-sealing bags with printed white areas for labels are very convenient. Label with an indelible marker pen. Alternatively, use a self-adhesive label.

Grain buyers often supply bags.
Moisture meters are used to estimate the moisture content of grain samples taken to represent the bulk. This helps the grower:

- manage drying and energy costs
- store grain at optimum moisture (<14%) to avoid spoilage
- maximise crop returns. Costly rejections or discounts are avoided if the average meter reading of delivered bulk grain meets contract specification (with a margin for error).

How moisture meters work

Moisture meters measure an electrical property that varies with moisture content.

- **Resistance** instruments use a ground sample and tend to be small.
- **Capacitance** meters use whole grain and are usually larger.

Moisture meter manufacturers provide calibrations by comparing the meter’s electrical measurement with actual moisture content determined by oven tests on samples of wheat, barley, oilseed rape etc.

In the laboratory, moisture content is determined by drying coarsely ground cereal grain for two hours at 130°C in a special oven and then measuring weight loss. The method is slow but accurate if the correct equipment and procedures are used.

Meter accuracy depends on the quality of calibration and instrument maintenance.

Moisture content, one of the most important characteristics for grain buyers and sellers, features in all contracts. High moisture content can result in spoilage and incur deductions, even rejection.

Need more information?

The best calibrations use large and varied data sets. For standard calibrations, several hundreds of grain samples representing a wide range of moisture contents and varieties over several years may be used.

For special calibrations, e.g., moisture content ex-grain drier, specific samples ensure compatibility between calibration and test material. (Consult the manufacturer to determine the basis of calibrations in your instrument.)
Perform any checks specified by the manufacturer before use.

Use a representative sample. Remove chaff, straw, immature grains etc.

Minimise temperature differences between sample and instrument to avoid condensation on grain or meter.

Test at a constant temperature, ideally 20±2°C.

Clean meter after use. Remove any whole or ground grains.

Regularly check and record instrument performance with samples of known moisture content.
1. Equipment

Keep equipment clean and only use for sampling and storing grain samples.

1.1. Samplers

• Pelican sampler
• 1 litre plastic jug
• Sampling spear (to collect about 750 g grain from one or several insertions). Preferably use a multi-aperture spear that can be opened and closed by the operator to collect grain from several depths at each insertion.

1.2. Containers

• 10 litre or larger plastic drums, boxes or tubs with lids.
• Sample bags of about 1 kg capacity – which can be effectively sealed and labelled.

Establish a system to relate samples to specific bins of grain or sections of a bulk store. Number bins and paint bay numbers on the walls of floor stores. Indicate these numbers on the site plan.

2. Collecting samples

Collect a sample of about 1 kg from the tailgate as trailers tip in the store. If trailer tips through a hatch in the tailgate, use a jug or pelican. If the whole tailgate is opened, only use the pelican. It may be safer to collect a sample from the tipped heap with a spear.

2.1. Technical details

Sweep a plastic jug or pelican sampler across the grain flow from the trailer, so as to cut the stream of grain. Remove the jug or pelican as soon as full. Sample in a consistent manner. Avoid sampling first or last parts of the load.

Sample the grain after tipping by inserting the spear and removing a sample(s) from at least three positions. Empty the jug, pelican or spear into a plastic container. Check moisture content and temperature of some grain from each individual sample first, if this container is used to build up a composite sample. Blend composite samples thoroughly before sub-sampling.

2.2. Testing

Measure the moisture content of each sample to give guidance on intake moisture and the need for drying. If the meter uses a large, un-ground sample, tip the grain back into the main sample after testing. Measure the temperature of the grain to indicate the need for in-store cooling.
3. Frequency of sampling

3.1 Storage potential
Assess samples from sufficient incoming loads for moisture and temperature to allow proper decisions to be made about drying and cooling. This may mean testing every load as moistures often change during the day.

3.2 Commercial sample
Produce one composite sample to represent each bin or each identified section or bay within a bulk store.
Start a new composite sample whenever moving to a new part of the store or taking grain from a different field.
Make up at least one composite sample for each 50 tonnes of grain irrespective of bin or bay size.
Samples best representing commercial value are made up from sub-samples taken as every trailer enters the store. Sub-sampling frequency depends upon intake variability.

4. Sample handling
Label the container holding the composite sample clearly outside and inside. Make sure that the sample can be related to an identifiable batch of grain in the store (bin or section of a store). Make sure that the labels correspond to the site plan.
Close the container with a lid that will prevent rodent access, stop contamination by dust or other grain and minimise moisture loss.
If grain in the store is moved, amend the site plan and ensure that the sample label still corresponds to the correct batch of grain. Moving the grain may also present an ideal time to re-sample and produce new composite samples.
Store the containers in the grain store under the same conditions as the grain they represent.

4.1 Sample storage
Samples with a moisture content of >14.5% may deteriorate during long-term storage; those with high moisture contents will go mouldy. Dry those with moisture content >14% by spreading thinly on a tray in a warm dry room for 24-48 hours and label as “dried”. Alternatively, send samples of wet grain for analysis without delay.

5. Extracting commercial samples
Mix the composite sample thoroughly before extracting any samples for buyers.
After mixing, tip the grain onto a clean plastic sheet and divide up using a clean board into halves, quarters and eighths, until the correct amount is obtained for the buyer’s sample.
Carefully remove all the buyer’s sample (about 1 kg) from the sheet, including all fine material and transfer to a plastic bag.
Seal and label bag.
It is worth measuring the moisture of this sample as, by doing so, a comparison between the farm and merchant’s moisture meter will be obtained.

6. Labelling
Label information for composite samples should include:
- date of collection; variety; moisture content(s); location of grain represented by the sample: eg Bin 3, or Shed 1: left bay 2.
Labels on buyer’s samples should include:
- farm address and any other identity codes; quality scheme membership number (attach an assurance scheme identity sticker to the sample bag); location of grain represented by the sample (it must be possible for the buyer to be able to identify the location of the batch of grain covered by the sample. In some cases this may differ from the farm office address); date of harvest; tonnes represented by sample; variety; and moisture content.

7. Safety
There are risks associated with the collection of samples. Assess the risks involved with specific tasks and locations, and take steps to minimise them.
Specific risks include:
- working near moving equipment
- conveying equipment - augers and elevators - must be guarded
- being engulfed by grain - never stand or walk on moving grain
- grain dust - wear a dust mask
- grain pits - must be covered with a protective grill.
When handling treated grain, personal protective clothing must be worn, eg gloves and masks.
Working at the back of trailers during tipping can be dangerous because of the risk of being hit by the swinging tailgate or by being engulfed by grain. Only approach the rear of the trailer if it safe to do so. Always ensure that the trailer driver knows the sampler is present, especially when the trailer has a hydraulic tailgate.
Sampling protocol - ex-drier

The aim of taking a sample or series of samples is to give a fair representation of a batch or bulk to allow assessment of quality, value and storage potential. Sampling grain going into store is not a substitute for sampling during storage.

1. Equipment

Keep equipment clean and only use for sampling and storing grain samples.

1.1. Samplers
• Pelican sampler
• 1 litre plastic jug
• Sampling spear (to collect about 750 g grain from one or several insertions). Preferably use a multi-aperture spear that can be opened and closed by the operator to collect grain from several depths at each insertion.
• Diverter sampler inserted permanently into drier input and output flows.

1.2. Containers
• 10 litre or larger plastic drums, boxes or tubs with lids
• Sample bags of about 1 kg capacity – which can be effectively sealed and labelled.

Establish a system to relate samples to specific bins of grain or sections of a bulk store. Number bins and paint bay numbers on the walls of floor stores. Indicate these numbers on the site plan.

2. Collecting samples

Sample collection site depends upon facilities. Options include drier outflow, conveyor discharge or point of grain discharge into bin or floor store. Use samples collected as grain enters drier to assess drier performance. The best and safest option is a permanent diverter sampler in the drier outflow.

2.1. Technical details
Sweep a plastic jug or pelican sampler across the grain flow from either conveyor or spout, so as to cut the stream of grain. Remove the jug or pelican as soon as full. Sample in a consistent manner.
Sample the grain after tipping by inserting the spear and removing a sample(s), from at least three positions.
Empty the jug, pelican or spear into a plastic container. Check moisture content and temperature of some grain from each individual sample first, if this container is used to build up a composite sample. Blend composite samples thoroughly before sub-sampling.
If using a diverter sampler, allow the grain to fall directly into the plastic container. Collect sub-samples at regular intervals and measure moisture content and temperature.

2.2. Testing
Measure the moisture content of each sample to confirm that final moisture content is low enough for safe storage.
If the test meter uses a large, un-ground sample, tip the grain back into the main sample after testing. Measure the temperature of the grain to indicate the need for in-store cooling.
3. Frequency of sampling

Sampling frequency depends on drier type, whether batch or continuous flow.

3.1 Storage potential
Measure temperature and moisture content of samples regularly. Base sampling frequency on grain moisture content before drying. Sample grain several times if moisture content varies within the bulk pre-drying.

3.2 Commercial sample
The best samples to represent commercial value comprise many sub-samples taken at relatively short intervals as grain is discharged from the drier.

For batch driers, collect several samples (at least 1/t of grain in the drier) as the dried batch is discharged.

Combine samples from several batches into a single composite sample, provided the grain represented by the sample is stored in an identified section of the store.

Produce one composite sample to represent each bin or each identified section or bay within a bulk store.

Start a new composite sample whenever moving to a new part of the store or taking grain from a different field.

Make up at least one composite sample for each 50 tonnes of grain irrespective of bin or bay size.

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Label the container holding the composite sample clearly outside and inside. Make sure that the sample can be related to an identifiable batch of grain in the store (bin or section of a store). Make sure that the labels correspond to the site plan.

Close the container with a lid that will prevent rodent access, stop contamination by dust or other grain and minimise moisture loss.

If grain in the store is moved, amend the site plan and ensure that the sample label still corresponds to the correct batch of grain. Moving the grain may also present an ideal time to re-sample and produce new composite samples.

Store the containers in the grain store under the same conditions as the grain they represent.

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Carefully remove all the buyer’s sample (about 1 kg) from the sheet, including all fine material and transfer to a plastic bag.

Seal and label bag.

It is worth measuring the moisture of this sample as, by doing so, a comparison between the farm and merchant’s moisture meter will be obtained.

6. Labelling

Label information for composite samples should include:
- date of collection; variety; moisture content(s); location of grain represented by the sample; e.g. Bin 3 or Shed 1; left bay 2.

Labels on buyer’s samples should include:
- farm address and any other identity codes; quality scheme membership number (attach an assurance scheme identity sticker to the sample bag); location of grain represented by the sample (it must be possible for the buyer to be able to identify the location of the batch of grain covered by the sample. In some cases this may differ from the farm office address); date of harvest; tonnes represented by sample; variety; and moisture content.

7. Safety

There are risks associated with the collection of samples. Assess the risks involved with specific tasks and locations, and take steps to minimise them.

Specific risks include:
- working near moving equipment
- conveying equipment – augers and elevators – must be guarded.
- being engulfed by grain. Never stand or walk on moving grain.
- drier exhaust fumes.
- grain dust – wear a dust mask.

When handling treated grain, personal protective clothing must be worn, e.g. gloves and masks.
Contacts & further reading

Contacts

ACCS - Assured Combinable Crops Scheme
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The Business Park
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E-mail:enquiries@cmi-plc.com

BRI - Brewing Research International
Lyttel Hall
Nutfield
Surrey
RH1 4HY
Tel:01737 822272
Fax:01737 822747
E-mail:bri@brewingresearch.co.uk

BPC - British Poultry Council
Europoint House
5 Lavington Street
London
SE1 0NZ
Tel:020 7202 4760
Fax:020 7928 6366
E-mail:bpc@poultry.uk.com

CCFRA - Campden & Chorleywood Food Research Association
Chipping Campden
Gloucestershire
GL55 6LD
Tel:01386 842000
E-mail:information@campden.co.uk

CSL - Central Science Laboratory
Sand Hutton
York
YO4 1LZ
Tel:01904 462000
Fax:01904 462111
E-mail:storage@csl.gov.uk

FABBL - Farm Assured British Beef and Lamb
PO Box 165
Winterhill House
Snowdon Drive
Milton Keynes
MK6 1PB
Tel:01908 231642
Fax:01908 844355
E-mail:info@fabbl.co.uk

FAC - Federation of Agricultural Co-operatives
(see NFU)

GAFTA - Grain and Feed Trade Association
Gafta House
6 Chapel Court
Chapel Place
London
EC2A 3DQ
Tel:020 7814 9666
Fax:020 7814 8383
E-mail:post@gafta.com

Genesis QA
Ryknield House
Alrewas
Burton on Trent
DE13 7AB
Tel:01283 791400
Fax:01283 791500
E-mail:info@genesisqa.com

MAGB - Maltsters Association of Great Britain
31b Castle Gate
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NG24 1AZ
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Fax:01636 701836
E-mail:info@magb.org.uk

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Milton Keynes
MK6 1AX
Tel:01908 677577
Fax:01908 609221
E-mail:contactus@mlc.org.uk

nabim - National Association of British and Irish Millers
21 Arlington Street
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SW1A 1RN
Tel:020 7493 2521
Fax:020 7493 6785
E-mail:info@nabim.org.uk

NFU
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London
WC2H 8HL
Tel:020 7331 7200
Fax:020 7331 7313
E-mail:nfu@nfu.org.uk

NFUS - NFU of Scotland
The Rural Centre
West Mains
Ingliston
Newbridge
Midlothian
EH28 8LJ
Tel:0131 472 4000
Fax:0131 472 4010
E-mail:information@nfus.org.uk

National Pig Association
PO Box 29072
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WC2H 8QS
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33 Kings Road
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Fax:0118 959 7736
E-mail:enquiries@rpa.gsi.gov.uk

SQC – Scottish Quality Cereals
Royal Highland Centre
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Tel:0131 335 6600
Fax:0131 335 6601
E-mail:sqc@sfqc.co.uk

UFU – Ulster Farmers Union
475 Antrim Road
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Fax:028 9037 1231
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UKASTA – United Kingdom Agricultural Supply Trade Association
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E-mail:enquiries@ukasta.org.uk

Further reading


Rodent control in agriculture - a guide, HGCA (2002) free to HGCA levy-payers, otherwise £25

Moisture meter guidelines, HGCA (2000) free to HGCA levy-payers

Introductory guide to milling wheat, HGCA (2002) free to HGCA levy-payers, otherwise £25

Introductory guide to malting barley, HGCA (2001) free to HGCA levy-payers, otherwise £25

Topic Sheet No. 26 - Sampling grain on-farm
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