

HACCP, Legislation and other requirements

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Agenda

- HACCP
- QMS Certification
- Quality Assurance
- Setting up a laboratory
- Beer Notice 226 – Duty calculation
- Risk Assessments
- Packaging Volume Requirements
- Allergen Declaration



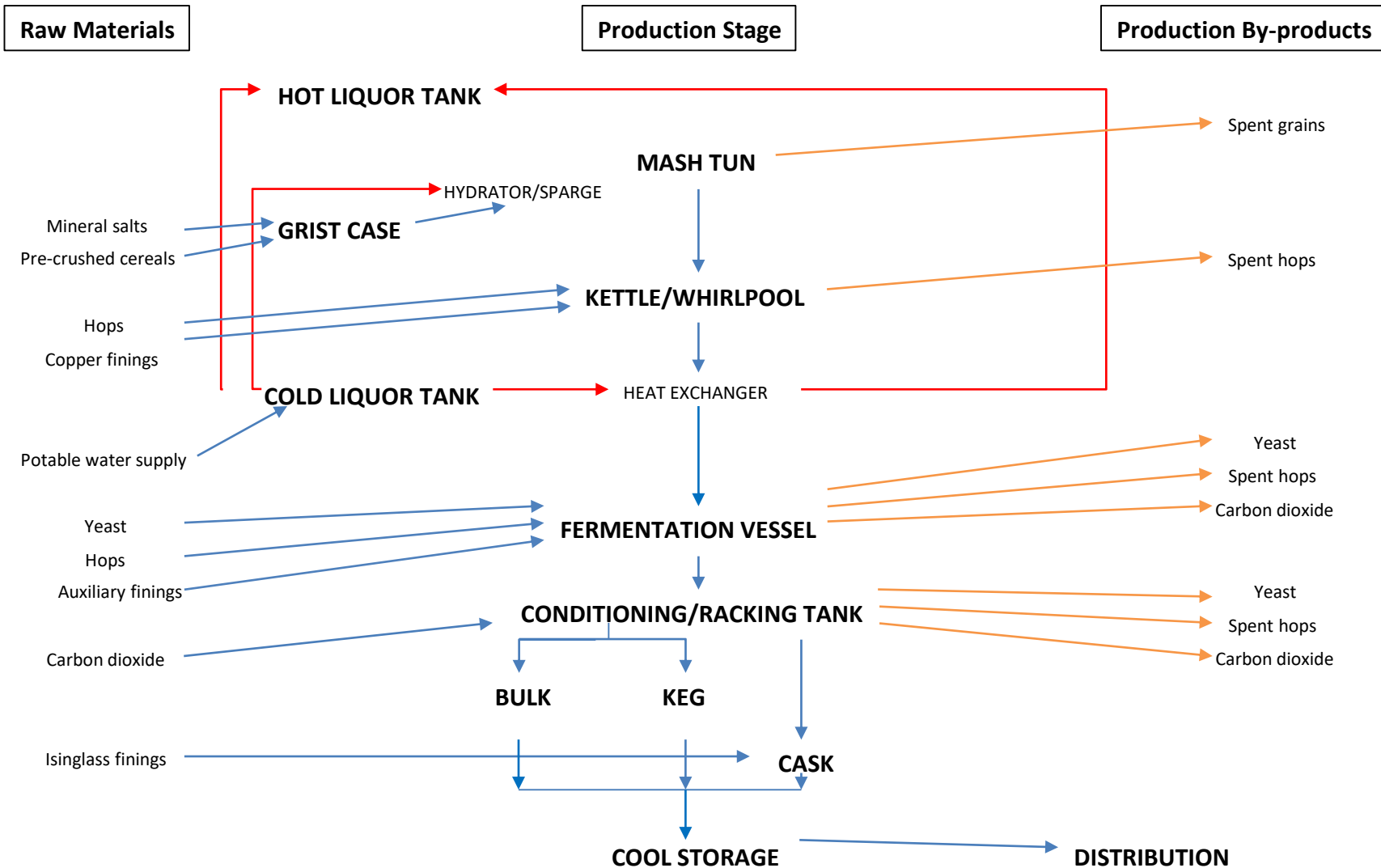
Quality Assurance

- What is QA?
- System where processes, raw materials and hygiene is controlled to ensure the product conforms to specification
- How is this achieved?
 - Setting process parameters
 - Building and using management systems
- What does it offer?
 - Consistency
 - Repeatability
 - Traceability - raw materials to final products

HACCP

- Hazard Analysis at Critical Control Points (HACCP) is a legal requirement
- It is a system that helps food business operators look at how they handle food and introduces procedures to make sure what they produce is safe to consume
- What is required?
 - Conduct a hazard analysis
 - Identify CCPs
 - Establish critical limits
 - Establish monitoring
 - Establish corrective actions
 - Define documentation and records
 - Implement and verify

HACCP – flow chart



HACCP - Hazards

- The HACCP plan will cover final product safety:
- Physical
 - Metal; Glass and brittle plastic; Flexible plastic; Stones; Paper/board; String; Pests; General foreign bodies in raw materials; Dropped objects (tools, pens, etc.) mislaid by operators.
- Chemical
 - Agricultural residues: Pesticides; Cleaning & sanitising chemicals; Chemical residues migrating from packaging; Propylene Glycol
- Allergens
 - Cereals containing gluten
- Microbiological
 - Spoilage by micro-organisms, either yeast or bacteria

HACCP – Pre-requisites

- Supplier approval;
- Packaging;
- Incoming material specifications;
- Finished product specification;
- Training (incl. training needs analysis, job descriptions);
- Contract services (i.e. waste/laundry);
- Pest Control;
- Calibration; Standard Operating Procedures (SOPs);
- Customer complaints;
- Tracking non-conformances;
- Traceability;
- Utilities (air, water, energy);
- Equipment suitability, cleaning and maintenance;
- Cleaning and sanitising;
- Personnel hygiene and employee facilities;
- Product information / consumer awareness;
- Return to work

HACCP – Prerequisite records

- Supplier Approval/Packaging/Utilities/Equipment Suitability/Cleaning/ - HACCP/H&S Folder - Main Brewery Office
- Pest Control - Operations Office Standard Operation Procedures - SOPs Folder - Brewery Office
- Customer Complaints - Ullage tracked on Brewman;
- Fault Report sheets in HACCP folder.
- Traceability - Brewsheets - Brewery office
- Incoming Material Specs - Malt Analysis/Del Notes Folder & Hop/Yeast Tech Data Folder in Brewery Office
- Product Information/Consumer awareness - Cask/Keg labels, can/bottle labelling.
- Allergen sheet available on request.

HACCP – Identification & list of potential hazards

Step No.	Step Name	Biological	Chemical	Physical	Allergens
1	Malt Intake	Agricultural residues e.g. pesticides Microbiological (growth)		Stones	
2	Load malt and salts to grist case		Calcium chloride Calcium sulphate	Foreign objects - stones, string, sacking.	Malted cereals (Gluten)
3	CIP		Harmful chemicals - Caustic Peracetic acid (PAA)		
4	Mash In	Bacteria / toxins		Foreign objects - stones, tools	
5	Mash Recirculation			Foreign objects	
6	Sparge	Presence of micro-organism/toxins		Foreign objects	

HACCP – Severity scores

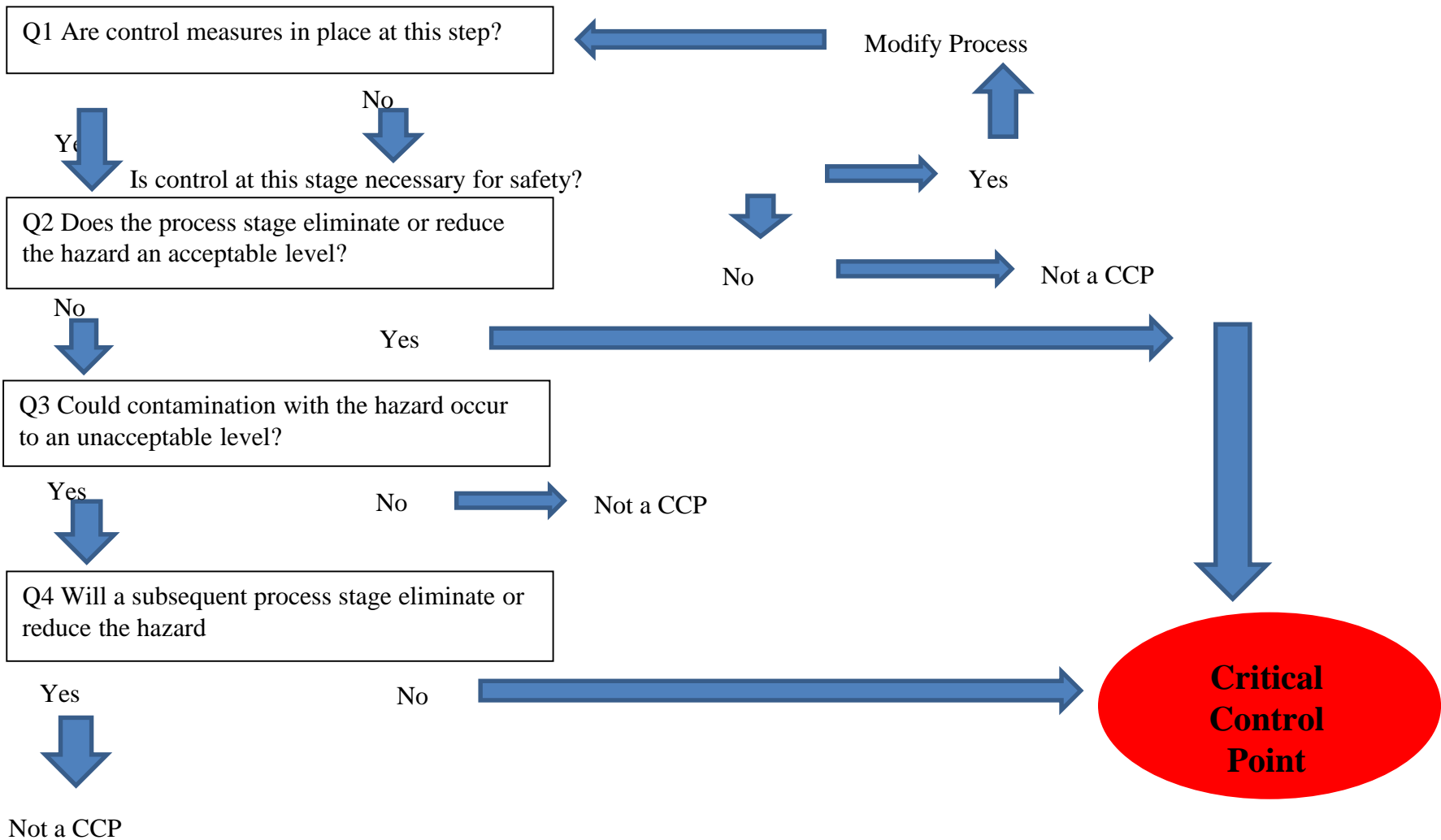
Hazard	Hazard Description	Severity	Likelihood	Significance
Mineral salts	Over addition of a potentially harmful chemical used as a water treatment	2	1	2
Foreign objects - stones, string, sacking.	Sacks of malt can contain foreign objects from the packaging process	1	3	3
Malted cereals (Gluten)	Primary raw material an allergen unsuitable for consumers with gluten allergy.	2	3	6

The threshold, above which we consider the hazard to be 'significant' is: **4**

HACCP – Control measures

Step No.	Step Name.	Hazard	Hazard Description	Control Measures
10	Wort collection and oxygenation	Foreign gases	Introduction of non-food safe gases or chemicals as a result of poor quality oxygen supply.	Only use food-grade oxygen from an approved supplier.
10	Wort collection and oxygenation	Chemical	Failure to flush the transfer line fully before connection to FV inlet leaving acid sterilant to be mixed into the product	PAA should be flushed from the line as a Standard Operational Procedure for this stage. pH checks are a Standard Operational Procedure before moving to the Fermentation stage.
11	Fermentation	Propylene Glycol	Vessel coolant leaking through the vessel wall into the product	pH checks of product on a daily basis. Visual inspection of vessel interior as part of Vessel CIP Standard Operational Procedure. Bi-Annual maintenance contract in place for glycol chiller with Approved Supplier.
13	Cask racking	Microbiological	Contaminated filling line contacting the product	ATP swab testing of residual sterilant in filling line to test for presence of microbiological life forms before commencing packing of the product

HACCP – Decision tree



HACCP – CCP determinates

Step No.	Hazard	Control Measures	Decision Tree	CCP?
11	Propylene glycol	pH checks of product on a daily basis. Visual inspection of vessel interior as part of Vessel CIP Standard Operational Procedure. Bi-Annual maintenance contract in place for glycol chiller with Approved Supplier.	Q1: Yes Q2: Yes Q3: No Q4: N/A	No
13	Chemical	PAA should be flushed from the line as part of the Standard Operational Procedure for this stage. pH check before commencing with packaging of the product.	Q1: Yes Q2: Yes Q3: No Q4: Yes	Yes
13	Physical	Visually inspect each cask prior to fill to ensure no foreign bodies present. Remove object and re-wash	Q1: Yes Q2: Yes Q3: No Q4: Yes	Yes

HACCP – Critical limits for CCPs

Step No.	Step Name.	Hazard	Critical limit	How was the critical limit determined?	Will the critical limit control the specific hazard?	Can the critical limit be measured or observed in real time?
13	Cask Racking	Physical	Zero foreign bodies	Above this value is indicated as a failure on quality and food safety grounds.	Yes	Yes
13	Cask Racking	Chemical	Final rinse water pH similar to incoming water supply		Yes	Yes
14	Keg Filling	Chemical	Final rinse water pH similar to incoming water supply		Yes	Yes

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HACCP – The plan

Process Step	Step no.	Hazard	Control Measure	Critical Limit	Monitoring Procedure	Corrective action
Cask Racking	13	Chemical	PAA should be flushed from the line as part of the Standard Operational Procedure for this stage. pH check before commencing with packaging of the product.	pH within 1 unit of incoming supply	<p>Monitoring activity frequency: At the beginning of every cask racking run</p> <p>How the monitoring activities are carried out: Once operative is satisfied line has been flushed of PAA they should take a sample, close off the line and pH test the sample.</p> <p>The following people are responsible for monitoring actions at this CCP: Operator in charge of packaging on shift</p> <p>The deputy is: Lead Brewer on shift</p> <p>The results of monitoring are recorded: Packaging Sheet</p> <p>Monitoring records will be checked and signed off by Head Brewer at the frequency of: Weekly</p>	<p>Corrective action to be taken: Run further product through the line to drain for a further 10 seconds and then repeat monitoring test</p> <p>Personnel who have the authority to take the stated corrective action: Operator in charge of packaging on shift</p> <p>All non-complying product is run to drain as part of corrective action.</p> <p>Actions for product produced when the CPP was out of control will be recorded on packaging sheet</p> <p>All personnel are trained and competent for performing the activities stated.</p> <p>Records of competency are maintained.</p>

HACCP - Verification

Validation study

QC samples kept and checked at set periods or on discovery of non-compliance/customer complaint.

The Head Brewer is responsible for ensuring the contents of the HACCP plan are validated and will also formally sign off the HACCP plan.

The following verification activities are undertaken:

Internal audits of

Critical Control Points; Prerequisites; Records of monitoring; Corrective actions

Finished product

Microbiological testing

Other

Addressing the findings of customer and third-party audits; Trending and analysing customer complaints

HACCP - Review

Deviations; All verification records are maintained

The HACCP system is formally reviewed annually. The Head Brewer is responsible for carrying out a formal annual review.

The following triggers will initiate a review in the organisation:

Technological advances in production; New controls that become available; Change of raw material supplier; Modification to process equipment (e.g. new equipment, modification of existing equipment); Failures in the system, e.g. corrective actions or the need for product recall/withdrawal; Receipt of information from the market place indicating a health risk associated with the product; Changes in legislation; New scientific/technical knowledge (e.g. new information on hazards and control measures)

All records from reviews are documented, brought to the attention of senior management and used to keep the HACCP plan up-to-date.

Quality Management Systems

- Why have a QA scheme?
 - Formal process used to review the operations, products and services of a business – with the objective being to identify areas that may require quality improvement. Quality management systems are required in all areas of business activity, regardless of the size of the institution. A good quality management system will:
 - Reduce wastage
 - Improve process control
 - Increase market share
 - Reduce costs
 - Facilitate training
 - Meet customers' expectations
 - Raise morale

QMS – Standards

- British Retail Consortium (BRC)
- International Standards Organisation
(ISO 9001:2015; ISO 22000:2005)
- Safe And Local Supplier Approval (Salsa + Beer)
- SIBA Food Safety & Quality



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Quality Control

- Measurement of a set of specifications for products
- Tests made for conformity

- Examples of analyses
- Analytical
 - Temperature, gravity, pH, colour, haze, bitterness, CO₂ content, dissolved oxygen (DO), head formation, taste, shelf-life
- Microbiological
 - Yeast counts, viability, contamination

Quality Control

- What equipment is required?
 - Saccharometers (HMRC standard),
 - Refractometer
 - Thermometers (plural)
 - pH meter and buffers (pH 4 & pH 7)
 - Microscope, haemocytometer, slides, methylene blue
 - Spectrophotometer
 - Pipettes
 - Balances
 - CO₂ meter and standards
 - O₂ meter



Legal requirements – Duty calculation

- www.gov.uk/government/publications/excise-notice-226-beer-duty
- Calculation of % ABV (Sect 30)
 - ‘If you have no or minimal laboratory facilities, you may calculate the alcoholic strength of your beer by multiplying the number of degrees by which the beer has attenuated by a factor. In order to make sure that your calculations are accurate, it is essential that the original gravity (OG) be established as soon as possible **after collection and before fermentation commences**, which will normally be within one hour of completion of **filling the fermenting vessel**’

Legal requirements - Calculating the %ABV

- Measure the OG within one hour of collection*
- Wait until fermentation is completed - for cask-conditioned beer this will be after secondary fermentation in the casks
- Measure the present gravity (PG) (also known as the specific or final gravity)*
- When you've taken your readings, calculate the alcoholic strength using the formula, $(OG - PG) \times f = a\% \text{ ABV}$, where:
 - OG is the original gravity of the beer
 - PG is the present gravity of the beer
 - a is the beer's alcoholic strength
 - f is the factor connecting the change in gravity to alcoholic strength. The value of 'f' isn't constant because the yield of alcohol isn't constant for all fermentations.

Legal requirements - Value of factor 'f'

(OG - PG)	% ABV	Factor
Up to 6.9	Up to 0.8	0.125
7.0 - 10.4	0.8 - 1.3	0.126
10.5 - 17.2	1.3 - 2.1	0.127
17.3 - 26.1	2.2 - 3.3	0.128
26.2 - 36.0	3.3 - 4.6	0.129
36.1 - 46.5	4.6 - 6.0	0.130
46.6 - 57.1	6.0 - 7.5	0.131
57.2 - 67.9	7.5 - 9.0	0.132
68.0 - 78.8	9.0 - 10.5	0.133
78.9 - 89.7	10.5 - 12.0	0.134
89.8 - 100.7	12.0 - 13.6	0.135

Legal requirements - Duty

- Calculating %ABV (Sect 30)
- '* Use a suitably calibrated saccharometer adjusted for the temperature of the representative sample'
 - Precision 10° or 20° Saccharometers (305mm long)
- Independent analysis – what & when?
 - At least one p.a. for permanent qualities & for **each** 'special/occasional' brand
 - By reference method (distillation)
- Primings - includes syrup flavourings (Sect 31)



Legal Requirements - H&S risk assessments

- www.hse.gov.uk/risk/
- Written procedures required if 5 or more employees
 - Good practice if fewer employees
- H&S covers
 - PPE; manual handling; high temp. & high press. vessels; local exhaust ventilation; working at heights; use of vehicles, lone working, COSHH, confined spaces, display equipment, electricity, first aid, legionella, slips trips & falls;
 - Requires collation of Technical Data and Safety Sheets for chemicals and materials used in processes.

Legal requirements - Fire risk assessments

- www.gov.uk/workplace-fire-safety-your-responsibilities
- Written procedures required if 5 or more employees
 - Good practice if fewer employees
- Covers
 - Fire hazard identification
 - Identification of people at risk
 - Evaluation, removal or reduction of the risks
 - Recording of findings, preparation of emergency plan and provision of training
 - Regular review and updating of the fire risk assessment

Legal requirements – Packaging rules

- <https://www.gov.uk/weights-measures-and-packaging-the-law/packaged-goods>
- 'It shall be the duty of the packer or importer of packages to ensure...
- the contents of the packages shall be not less on average than the nominal quantity'... (Sect 4)
 - i.e. packs to contain at least the amount indicated on the label

Percentage of production volume	500ml (shortfill allowed)	Firkin (shortfill allowed)
Not less than 2.5%	3% (15 ml)	1% (14 fl.oz.)
0% - i.e. NONE	6%	2%

- Need packaging production records

Legal requirements – Allergen declaration

- <http://www.food.gov.uk/sites/default/files/food-allergen-labelling-technical-guidance.pdf>
- Food Information Regulations 2014 (FIR) – Dec '14
- Small pack (<25 l)
 - 'labels must declare any allergens either as a "Contains" statement, or within the list of ingredients'
- Large Pack (>25l)
 - 'labels must include the Minimum Durability (Best Before End) of the product'
 - 'if greater than 1.2% ABV, the alcoholic strength and an allergy declaration must be supplied, although this may be on supporting paperwork'
- 'Brewers should also note that it will be mandatory to declare allergens present in draught beer to the consumer at the point at which an order is made – please note that this requirement is for both sales at retail premises and via "distance selling" i.e. telephone, mail order, online/website'

Questions?

