Institute for Apprenticeships & Technical Education

DRAFT END-POINT ASSESSMENT PLAN FOR THE DAIRY TECHNOLOGIST APPRENTICESHIP STANDARD

APPRENTICESHIP STANDARD REFERENCE NUMBER	LEVEL OF THIS END-POINT ASSESSMENT (EPA)	INTEGRATED
ST0393	5	No

Contents

Introduction and overview

This document explains the requirements for end-point assessment (EPA) for the dairy technologist apprenticeship. End-point assessment organisations (EPAOs) must follow this when designing and delivering their EPA.

Dairy technologist apprentices, their employers and training providers should read this document.

An approved EPAO must conduct the EPA for this apprenticeship. Employers must select an approved EPAO from the Education and Skills Funding Agency's Register of end-point assessment organisations (RoEPAO).

A full-time apprentice typically spends 36 months on-programme (this means in training before the gateway) working towards competence as a dairy technologist. All apprentices must spend at least 12 months on-programme. All apprentices must spend at least 20% of their on-programme time completing off-the-job training.

This EPA has 3 assessment methods.

The grades available for each EPA method are:

EPA method 1 - project report and presentation with questions:

- fail
- pass
- distinction

EPA method 2 - professional discussion underpinned by a portfolio of evidence:

- fail
- pass
- distinction

EPA method 3 - written test:

- fail
- pass

The result from each EPA method is combined to decide the overall apprenticeship grade. The following grades are available for the apprenticeship:

- fail

- pass

- merit

- distinction

EPA summary table

On-programme (typically 36 months)	Training to develop the knowledge, skills and behaviours (KSBs) of the occupational standard. Training towards English and mathematics qualifications at Level 2[1], if required. Compiling a portfolio of evidence.
End-point assessment gateway	The employer must be content that the apprentice is working at or above the level of the occupational standard. The apprentice's employer must confirm that they think the apprentice: • is working at or above the occupational standard as a dairy technologist • has the evidence required to pass the gateway and is ready to take the EPA Apprentices must have achieved English and mathematics at Level 2[1]. The apprentice must submit all gateway evidence to the EPAO. When the EPAO confirms the gateway requirements have been met, the EPA period starts and typically takes 6 months to complete. For the project report and presentation with questions, the apprentice must submit a project summary. For the professional discussion underpinned by a portfolio of evidence, the apprentice must submit a portfolio of evidence. The apprentice must submit any policies and procedures as requested by the EPAO.
End-point assessment (typically 6 months)	**Grades available for each method:** Project report and presentation with questions • fail • pass • distinction

	Professional discussion underpinned by a portfolio of evidence
	- fail - pass - distinction Written test - fail - pass **Overall EPA and apprenticeship can be graded:** - fail - pass - merit - distinction
Professional recognition	This apprenticeship standard aligns with The Science Council for Registered Scientist (RSci). For those who choose to register, after successfully completing their apprenticeship a shortened application route applies. Individuals need to be a member of professional body that is licensed by the Science Council to be awarded this status. Further information on the shortened application route for completing apprentices is available on the Science Council website.
Re-sits and re-takes	- Re-take and re-sit grade cap: pass - Re-sit timeframe: typically, 2 months - Re-take timeframe: typically, 4 months

[1]For those with an education, health and care plan or a legacy statement, the apprenticeship's English and mathematics minimum requirement is Entry Level 3. British Sign Language (BSL) qualifications are an alternative to English qualifications for those who have BSL as their primary language.

Length of end-point assessment period

The EPA will be taken within the EPA period. The EPA period begins when the EPAO confirms the gateway requirements are met and is typically 6 months.

The EPA period starts when the EPAO confirms all gateway requirements have been met. The expectation is they will do this as quickly as possible.

EPA gateway

The apprentice's employer must confirm that they think the apprentice is working at or above the occupational standard as a dairy technologist. They will then enter the gateway. The employer may take advice from the apprentice's training provider(s), but the employer must make the decision.

The apprentice must meet gateway requirements before starting their EPA.

These are:

- achieved English and mathematics at Level 2 [1].

- for the project report and presentation with questions the apprentice must submit a project summary

The project summary must be submitted to the EPAO. It should be no more than 500 words. This needs to show that the project will provide the opportunity for the apprentice to cover the KSBs mapped to this EPA method. It is not assessed.

- for the professional discussion underpinned by a portfolio of evidence the apprentice must submit a portfolio of evidence

Portfolio of evidence requirements:

The apprentice must compile a portfolio of evidence during the on-programme period of the apprenticeship. It should contain evidence related to the KSBs that will be assessed by this assessment method. The portfolio of evidence will typically contain 10 discrete pieces of evidence. Evidence should be mapped against the KSBs.

Evidence may be used to demonstrate more than one KSB; a qualitative as opposed to quantitative approach is suggested. Evidence sources may include:

- workplace documentation and records

- workplace policies and procedures

- witness statements

- annotated photographs

- video clips (maximum total duration 20 minutes); the apprentice must be in view and identifiable

- learning records and plans

This is not a definitive list; other evidence sources can be included.

The portfolio should not include reflective accounts or any methods of self-assessment. Any employer contributions should focus on direct observation of performance (for example

witness statements) rather than opinions. The evidence provided should be valid and attributable to the apprentice; the portfolio of evidence should contain a statement from the employer and apprentice confirming this.

The EPAO should not assess the portfolio of evidence directly as it underpins the discussion. Independent assessors should review the portfolio of evidence prepare questions for the professional discussion. They are not required to provide feedback after this review.

The apprentice must submit any policies and procedures as requested by the EPAO.

The EPA period starts when the EPAO confirms all gateway requirements have been met. The expectation is they will do this as quickly as possible.

Assessment methods

The assessment methods can be delivered in any order.

The result of one assessment method does not need to be known before starting the next.

Project report and presentation with questions

Overview

A project involves the apprentice completing a significant and defined piece of work that has a real business application and benefit. The project must meet the needs of the employer's business and be relevant to the apprentice's occupation and apprenticeship.

The project must start after the apprentice has gone through the gateway.

This EPA method has 2 components:

- a project report
- a presentation with questioning

The 2 components must be assessed holistically by the independent assessor across the KSBs as shown in the mapping.

Rationale

This EPA method is being used because:

- it allows for the assessment of KSBs that take place over a long period of time
- it allows the apprentice to directly demonstrate knowledge and skills relating to communication and presentation
- it allows for the presentation of evidence and testing of responses where there are a range of potential answers that cannot be assessed through the test
- it can be conducted remotely, potentially reducing cost

Component 1: Project with a project output

Delivery

Apprentices must complete a project based on any of the following:

- a specific problem

- a recurring issue

- an idea or opportunity

- introducing a change or changes

To ensure the project allows the apprentice to meet the KSBs mapped to this EPA method to the highest available grade, the EPAO should sign-off the project summary at the gateway to confirm it is suitable. The EPAO must refer to the grading descriptors to ensure that projects are pitched appropriately.

The apprentice must start the project after the gateway. They must complete and submit the report to the EPAO after a maximum of 16 weeks. The employer should ensure the apprentice has the time and resources within this period to plan and complete their project.

The apprentice may work as part of a team to complete the project, which could include internal colleagues or external support. The apprentice must complete their project report and presentation unaided and they must be reflective of their own role and contribution. The apprentice and their employer must confirm this when they are submitted.

The report must include at least:

- introduction

- the scope of the project

- a project plan

- project delivery

- data and evidence sources

- project outcomes

- recommendations and conclusions - lessons learnt

The project report has a maximum word count of 5000 words. A tolerance of 10% above or below the word count is allowed at the apprentice's discretion. Appendices, references and diagrams are not included in this total. The project report must map, in an appendix, how it evidences the relevant KSBs mapped to this EPA method.

Component 2: Presentation with questioning

Delivery

Apprentices must prepare and submit and deliver a presentation on their project. After the presentation, the independent assessor must ask questions.

The presentation and questioning must last 50 minutes This will typically include a presentation of 20 minutes and questioning lasting 30 minutes. The independent assessor can increase the time of the presentation and questioning by up to 10%. This time is to allow the apprentice to respond to a question if necessary.

The presentation should cover:

- an overview of the project

- the project scope (including key performance indicators)

- summary of actions undertaken by the apprentice

- project outcomes and how these were achieved

The independent assessor must ask at least 6 questions. They must use the questions from the EPAO's question bank or create their own questions in-line with the EPAO's training. Follow up questions are allowed where clarification is required.

The purpose of the independent assessor's questions is:

- to verify that the activity was completed by the apprentice

- to seek clarification where required

- to assess those KSBs that the apprentice did not have the opportunity to demonstrate during the report, although these should be kept to a minimum

- to assess level of competence against the grading descriptors

The apprentice must prepare and submit their presentation to the EPAO at the same time as the report - a maximum of 16 weeks after the gateway.

The apprentice must notify the EPAO, at the submission of the presentation, of any technical requirements for the presentation.

The independent assessor must have at least 2 weeks to review the project report and presentation, before the presentation is delivered by the apprentice, to allow them to prepare appropriate questions.

Apprentices must be given at least 0 2 weeks' notice of the date and time of the presentation with questioning session.

Assessment location

The presentation with questioning must take place in a suitable venue selected by the EPAO for example, the EPAO's or employer's premises. The presentation with questioning should take place in a quiet room, free from distractions and influence.

The presentation with questioning can be conducted by video conferencing.

The EPAO must have processes in place to verify the identity of the apprentice and ensure the apprentice is not being aided.

Question and resource development

EPAOs must write an assessment specification and question bank. The specification must be relevant to the occupation and demonstrate how to assess the KSBs shown in the mapping. It is recommended that the assessment specification and question bank is developed in consultation with employers of this occupation. EPAOs should maintain the security and confidentiality of EPA materials when consulting employers. The questions must be unpredictable. A question bank of sufficient size will support this. The assessment specification and questions must be reviewed at least once a year to ensure they remain fit-for-purpose.

EPAOs must develop purpose-built question banks and ensure that appropriate quality assurance procedures are in place for example, considering standardisation, training and moderation. EPAOs must ensure that questions are refined and developed to a high standard.

EPAOs must ensure that apprentices have a different set of questions in the case of re-sits or re-takes.

EPAOs must produce the following materials to support the project report and presentation with questioning:

- independent assessor EPA materials which include:

  - training materials

  - administration materials

  - moderation and standardisation materials

  - guidance materials

  - grading guidance

  - question bank

- EPA guidance for the apprentice and employer

Professional discussion underpinned by a portfolio of evidence

Overview

In the professional discussion, an independent assessor and apprentice have a formal two-way conversation. It gives the apprentice the opportunity to demonstrate their competency across the KSBs as shown in the mapping.

Rationale

This EPA method is being used because:

- it allows for assessment of KSBs that do not occur on a predictable or regular basis

- it allows for testing of responses where there are a range of potential answers that cannot be tested through a test

  it can be conducted remotely, potentially reducing cost

Delivery

The independent assessor conducts and assesses the professional discussion.

The professional discussion must be structured to give the apprentice the opportunity to demonstrate the KSBs mapped to this EPA method to the highest available grade.

The purpose of the independent assessor's questions is to assess the following themes:

- dairy industry and business considerations
- compliance
- quality assurance
- scientific concepts, principles and techniques
- engineering concepts and principles
- environmental impact
- innovation
- information technology
- technical written content
- workplace training and development

The EPAO must give an apprentice 2 weeks' notice of the professional discussion. The independent assessor must have at least 2 weeks to review the supporting documentation.

Apprentices must have access to their portfolio of evidence during the professional discussion.

Apprentices can refer to and illustrate their answers with evidence from their portfolio of evidence, however the portfolio of evidence is not directly assessed.

The professional discussion must last for 90 minutes. The independent assessor can increase the time of the professional discussion by up to 10%. This time is to allow the apprentice to respond to a question if necessary.

For the professional discussion, the independent assessor must ask at least 10 questions. Follow-up questions are allowed. The independent assessor must use the questions from the EPAO's question bank or create their own questions in-line with the EPAO's training.

The independent assessor must keep accurate records of the assessment. The records must include the KSBs met, the grade achieved and answers to questions.

The independent assessor will make all grading decisions.

Assessment location

The professional discussion must take place in a suitable venue selected by the EPAO (for example the EPAO's or employer's premises).

The professional discussion can be conducted by video conferencing. The EPAO must have processes in place to verify the identity of the apprentice and ensure the apprentice is not being aided.

The professional discussion should take place in a quiet room, free from distractions and influence.

Question and resource development

EPAOs must write an assessment specification and question bank. The specification must be relevant to the occupation and demonstrate how to assess the KSBs shown in the mapping. It is recommended that the assessment specification and question bank are developed in consultation with employers of this occupation. EPAOs should maintain the security and confidentiality of EPA materials when consulting employers. The questions must be unpredictable. A question bank of sufficient size will support this. The assessment specification and questions must be reviewed at least once a year to ensure they remain fit-for-purpose.

EPAOs must develop purpose-built question banks and ensure that appropriate quality assurance procedures are in place, for example, considering standardisation, training and moderation. EPAOs must ensure that questions are refined and developed to a high standard.

EPAOs must ensure that apprentices have a different set of questions in the case of re-sits or re-takes.

EPAOs must produce the following materials to support the professional discussion underpinned by a portfolio of evidence:

- independent assessor assessment materials which include:
    - training materials
    - administration materials
    - moderation and standardisation materials
    - guidance materials
    - grading guidance
    - question bank
- EPA guidance for the apprentice and employer

Written test

Overview

A test is an assessment for asking questions in a controlled and invigilated environment.

Rationale

This EPA method is being used because:

- it allows for the efficient testing of knowledge where there is a right or wrong answer

- it allows for flexibility in terms of when, where, and how it is taken

- it allows larger volumes of apprentices to be assessed at one time

Delivery

This method must be appropriately structured to give the apprentice the opportunity to demonstrate the KSBs mapped to this EPA method to the highest available grade.

The written test can be computer or paper based.

The written test will consist of 15 long response written questions. Long answer questions need a written response of typically 1-2 paragraphs, around 100 words.

The written test must have one question for each theme – see mapping of KSBs to themes.

A question must be awarded between 4-6 marks. A test paper must have 75 marks. Each question should clearly state the marks available. Papers must have a pass mark of 52. Question papers must be of equal challenge.

Individual marks can be awarded for partial responses. Half marks are not permitted. Where there is insufficient evidence to award any marks in a response, a zero mark must be given.

Marks will be awarded in line with the EPAO's mark scheme. The grading descriptors must inform the mark scheme.

Apprentices must be given at least 2 weeks' notice of the date and time of the written test.

Test administration

Apprentices must have 120 minutes to complete the test.

The written test is closed book which means that the apprentice cannot refer to reference books or materials whilst taking the test.

The written test must be taken in the presence of an invigilator who is the responsibility of the EPAO. Specialised (proctor) software can be used if the test can be taken on-line, to ensure the security of the test.

The EPAO must have an invigilation policy setting out how the written test must be conducted. It must state the ratio of apprentices to invigilators for the setting and allow the test to take place in a secure way.

The EPAO must verify the identity of the apprentice.

The EPAO is responsible for the security of the written test including the arrangements for on-line testing. The EPAO must ensure that their security arrangements maintain the validity and reliability of the written test.

Marking

The written test must be marked by independent assessors or markers employed by the EPAO. Markers must have the same occupational competence and experience as an independent assessor, as defined in the IQA section.

The EPAO must develop a marking scheme based on the grading descriptors for this assessment method. The EPAO is responsible for overseeing the marking of the written test. The EPAO must set the standard and maintain that standard over time. The EPAO must ensure standardisation and the moderation of written response tests.

Assessment location

Apprentices must take the written test in a suitably controlled and invigilated environment that is a quiet room, free from distractions and influence. The EPAO must check the venue is suitable.

The written test could take place remotely if the appropriate technology and systems are in place to prevent malpractice. EPAOs must verify the apprentice's identity and ensure invigilation of apprentices for example with, and not limited to, 360-degree cameras and screen sharing facilities.

Question and resource development

EPAOs must write a test specification and question bank. The specification must be relevant to the occupation and demonstrate how to assess the KSBs shown in the mapping. It is recommended that the assessment specification and question bank are developed in consultation with employers of this occupation. EPAOs should maintain the security and confidentiality of EPA materials when consulting employers. The questions must be unpredictable. A question bank of sufficient size will support this. The test specification and questions must be reviewed at least once a year to ensure they remain fit-for-purpose.

EPAOs must develop purpose-built question banks and ensure that appropriate quality assurance procedures are in place for example, considering previous item performance data, item analysis, standardisation, training and moderation. EPAOs must ensure that questions are refined and developed to a high standard.

EPAOs must ensure that apprentices have a different set of questions in the case of re-sits or re-takes.

EPAOs must produce the following materials to support the written test:

- independent assessor assessment materials which include:

    - training materials

    - administration materials

    - moderation and standardisation materials

    - guidance materials

    - grading guidance

    - test specification

    - sample test and mark schemes

- live tests and mark schemes
- question bank
- EPA guidance for the apprentice and employer

Map KSBs to grade themes

Project report and presentation with questions - Project

KSBS GROUPED BY THEME	KNOWLEDGE	SKILLS	BEHAVIOUR
Data, information, and concepts K25 S8 S12	Data analysis techniques. Data analysis and reporting systems. (K25)	Apply extended knowledge of underlying dairy concepts. (S8) Collect data. Analyse, interpret, and evaluate data, scientific and technology information, concepts, and ideas including use of statistical methods. (S12)	N/A

Project report and presentation with questions - Project

KSBS GROUPED BY THEME	KNOWLEDGE	SKILLS	BEHAVIOUR
Problem solving and continuous improvement K23 K24 S14 S15	Problem solving and fault finding: 5 whys, root cause analysis, Failure Mode Effects Analysis (FMEA). (K23) Continuous improvement principles and techniques: Plan-do-check-act (PDCA), Lean, 6 Sigma, and Statistical Process Control (SPC). Lean manufacturing tools. Process mapping. (K24)	Apply problem solving techniques, identifying issues. Propose solutions to problems. (S14) Use continuous improvement techniques and make recommendations. (S15)	N/A

Project report and presentation with questions - Project

KSBS GROUPED BY THEME	KNOWLEDGE	SKILLS	BEHAVIOUR
Environment and sustainability K27 S5 S6 B2	Environmental Protection Act and environmental management systems. (K27)	Comply with environmental regulations, guidelines, and procedures. (S5) Apply sustainable working practices. For example, efficient use of resources, waste minimisation. (S6)	Take personal responsibility for and promote sustainable working practices. (B2)

Project report and presentation with questions - Project

KSBS GROUPED BY THEME	KNOWLEDGE	SKILLS	BEHAVIOUR
Working with others K2 K20 K31 K34 S19 S21 B6 B7	Different teams and functions involved in dairy production. Dairy technologist role. Limits of scope of practice: when to seek input from others and when to escalate. (K2) Leadership and management techniques: influencing, negotiation, and conflict management. (K20) Communication techniques. (K31) Equality, diversity, and inclusion. Unconscious bias. (K34)	Communicate with others for example, colleagues, customers, and stakeholders. Use industry terminology where appropriate. (S19) Negotiate with and influence colleagues or stakeholders; manage conflict. (S21)	Recognise limitations, seek input from others and escalate issues when required. (B6) Collaborate with others for example, within teams, across disciplines, and external stakeholders, promoting inclusion. (B7)

Project report and presentation with questions - Project

KSBS GROUPED BY THEME	KNOWLEDGE	SKILLS	BEHAVIOUR
Project and change management K21 K22 S13 S16 B4 B5	Change management principles and techniques. (K21) Project management roles and techniques: planning, prioritising, organising, stakeholder management, and risk management. (K22)	Apply changes to dairy processing unit operations. (S13) Apply project management techniques: planning and prioritising tasks, organising resources, managing stakeholders and risk management. (S16)	Take responsibility for the quality of work and enable others to work to high standards. For example, decisive, self-reliant, and motivated. (B4) Respond and adapt to work demands and situations. (B5)

Project report and presentation with questions - Project

KSBS GROUPED BY THEME	KNOWLEDGE	SKILLS	BEHAVIOUR
Presentation S20 B3	N/A	Create and deliver presentations. (S20)	Act in a professional manner. (B3)

Professional discussion underpinned by a portfolio of evidence - Discussion

KSBS GROUPED BY THEME	KNOWLEDGE	SKILLS	BEHAVIOUR
Dairy industry and business considerations K1 B8	The dairy industry structure. Financial considerations. Ethical business practices. (K1)	N/A	Ambassador for the dairy industry. (B8)

Professional discussion underpinned by a portfolio of evidence - Discussion

KSBS GROUPED BY THEME	KNOWLEDGE	SKILLS	BEHAVIOUR
Compliance K7 S1 S2 S3 S4 B1	Food safety management control of dairy and related food systems: Hazard Analysis and Critical Control Points (HACCP), Threat Analysis of Critical Control Points (TACCP), and Vulnerability Assessment of Critical Control Points (VACCP). (K7)	Apply food safety management systems. (S1) Apply food and dairy hygiene practice principles. (S2) Comply with food safety regulations and procedures. (S3) Comply with health and safety regulations, guidelines, and procedures. (S4)	Take personal responsibility for and promote food safety and health and safety. (B1)

Professional discussion underpinned by a portfolio of evidence - Discussion

KSBS GROUPED BY THEME	KNOWLEDGE	SKILLS	BEHAVIOUR
Quality assurance K11 S7	Function of quality assurance within the dairy industry. Quality assurance schemes and factors affecting the Quality Management Plan (QMP). (K11)	Apply quality control processes. (S7)	N/A

Professional discussion underpinned by a portfolio of evidence - Discussion

KSBS GROUPED BY THEME	KNOWLEDGE	SKILLS	BEHAVIOUR
Scientific concepts, principles and techniques S9 S10	N/A	Identify, review and evaluate, and select scientific techniques, procedures, and methods in the context of new and different areas of work. (S9) Apply scientific techniques, procedures, and methods to undertake tasks. (S10)	N/A

Professional discussion underpinned by a portfolio of evidence - Discussion

KSBS GROUPED BY THEME	KNOWLEDGE	SKILLS	BEHAVIOUR
Engineering concepts and principles K13 S11	Basic physical and hygienic design principles of dairy process engineering: mass and energy balances, modes of thermal transfer, principles of fluid flow, and rheology (deformation and flow of materials - solids and liquids). (K13)	Apply engineering concepts and principles to analyse dairy performance. (S11)	N/A

Professional discussion underpinned by a portfolio of evidence - Discussion

KSBS GROUPED BY THEME	KNOWLEDGE	SKILLS	BEHAVIOUR
Environmental impact K28 S17	Measuring environment impact and environmental audit requirements. (K28)	Conduct environmental impact assessments. (S17)	N/A

Professional discussion underpinned by a portfolio of evidence - Discussion

KSBS GROUPED BY THEME	KNOWLEDGE	SKILLS	BEHAVIOUR
Innovation K15	Product development processes: recipe development, specifications, market gap identification, acceptance testing and process design, packaging requirements, and nutrition and organoleptic characteristics. (K15)	N/A	N/A

Professional discussion underpinned by a portfolio of evidence - Discussion

KSBS GROUPED BY THEME	KNOWLEDGE	SKILLS	BEHAVIOUR
Information technology K30 S22	Information technology: Management Information Systems (MIS), spreadsheets, presentation, word processing, email, virtual communication and learning platforms. General Data Protection Regulation (GDPR). Cyber security. (K30)	Use information and digital technology. (S22)	N/A

Professional discussion underpinned by a portfolio of evidence - Discussion

KSBS GROUPED BY THEME	KNOWLEDGE	SKILLS	BEHAVIOUR
Technical written content K32 S18	Report writing techniques. (K32)	Develop technical written content. For example, operating procedures, working instructions, and reports. (S18)	N/A

Professional discussion underpinned by a portfolio of evidence - Discussion

KSBS GROUPED BY THEME	KNOWLEDGE	SKILLS	BEHAVIOUR
Workplace training and development K33 S23 B9	Workplace training and development techniques: coaching and transfer of knowledge. (K33)	Identify training needs. Coach individuals. (S23)	Committed to maintaining and enhancing competence of self and others through Continued Professional Development (CPD). (B9)

Written test - TestExamination

KSBS GROUPED BY THEME	KNOWLEDGE	SKILLS	BEHAVIOUR
Manufacturing operations K3	Good Manufacturing Practice (GMP). Production and operational planning concepts. (K3)	N/A	N/A

Written test - TestExamination

KSBS GROUPED BY THEME	KNOWLEDGE	SKILLS	BEHAVIOUR
Health and safety K4	Health and safety. Health and Safety at Work Act – responsibilities. Health and safety culture. Control of Substances Hazardous to Health (CoSHH). The Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR). Manual handling. Personal Protective Equipment (PPE). Types of hazards. Risk assessments, mitigation methods, and method statements (safe systems of work). (K4)	N/A	N/A

Written test - TestExamination

KSBS GROUPED BY THEME	KNOWLEDGE	SKILLS	BEHAVIOUR
Food and dairy safety K5	Principles of food and dairy safety. Allergenic control. Good Hygienic Practice (GHP). Microbiology and food borne illnesses. Biological, physical, allergenic (cross-contamination), and chemical contamination of dairy and related products. Food storage, temperature control and preservation of dairy products. Hygienic design, construction and maintenance of food premises and equipment, and their cleaning and disinfection. Pest control. Personal hygiene and training requirements. Food safety culture. Traceability. (K5)	N/A	N/A

Written test - TestExamination

KSBS GROUPED BY THEME	KNOWLEDGE	SKILLS	BEHAVIOUR
Food safety legislation K6	Food safety legislation principles: Food Safety Act, Regulation (EC) 852/2004, The General Food Law Regulation (EC) 178/2002, The Food Safety and Hygiene (England) Regulations, The Food Hygiene (Scotland) Regulations, The Food Hygiene (Wales) Regulations, The Food Information to Consumers Regulations (EC)1169/2011, Food Information Regulations, Regulation (EC) No 2073/2005 on Microbiological criteria for foodstuffs, The Weights and Measures (Packaged Goods) Regulations. Sources of information for legislation changes. (K6)	N/A	N/A

Written test - TestExamination

KSBS GROUPED BY THEME	KNOWLEDGE	SKILLS	BEHAVIOUR
Dairy chemistry K8	Principles of dairy chemistry. Chemical properties. Compositional milk and dairy product analysis. Quality testing of milk and dairy products. (K8)	N/A	N/A

Written test - TestExamination

KSBS GROUPED BY THEME	KNOWLEDGE	SKILLS	BEHAVIOUR
Dairy microbiology K9	Principles of dairy microbiology. Types of micro-organisms and their structure. Cultivation conditions and procedures. Aseptic conditions and Good Laboratory Practice (GLP): organisation and discipline within the laboratory. Hygiene monitoring and auditing. Laboratory analysis techniques. Indicator organisms. Interpretation of microbiological data as an indicator of risk. (K9)	N/A	N/A

Written test - TestExamination

KSBS GROUPED BY THEME	KNOWLEDGE	SKILLS	BEHAVIOUR
Milk and dairy products K10	Milk and dairy derivatives as raw materials. Primary production. Dairy farming practice. Composition of milk and dairy produce. Additives. Dairy products as an ingredient in other foods and associated allergenic issues. Dairy alternatives (non-milk based ingredients). (K10)	N/A	N/A

Written test - TestExamination

KSBS GROUPED BY THEME	KNOWLEDGE	SKILLS	BEHAVIOUR
Cleaning, disinfection, and sterilisation K12	Cleaning, disinfection, and sterilisation. Different techniques: chemical, heat, steam technology and ultraviolet - when they should be used. Components of Clean In Place (CIP). New developments in cleaning technology. Environmental impact of cleaning. Cleaning validation, verification, and optimisation techniques. (K12)	N/A	N/A

Written test - TestExamination

KSBS GROUPED BY THEME	KNOWLEDGE	SKILLS	BEHAVIOUR
Dairy supply chain K26	Dairy supply chain: mapping and risk management. World dairy economic drivers. Milk and dairy product supply and demand factors. Food security. (K26)	N/A	N/A

Written test - TestExamination

KSBS GROUPED BY THEME	KNOWLEDGE	SKILLS	BEHAVIOUR
Operations K14	Principles of food industry unit operations. Preservation operations. Dairy industry unit operations. Factory service operations. (K14)	N/A	N/A

Written test - TestExamination

KSBS GROUPED BY THEME	KNOWLEDGE	SKILLS	BEHAVIOUR
Milk processing K16	Milk processing: end-to-end. New concepts in milk processing. By-products. (K16)	N/A	N/A

Written test - TestExamination

KSBS GROUPED BY THEME	KNOWLEDGE	SKILLS	BEHAVIOUR
Cheese and fermented products K17	Cheese and fermented product technology. Cheese and cheese related products. Yogurt and related products. Soured creams and crème fraiche. (K17)	N/A	N/A

Written test - TestExamination

KSBS GROUPED BY THEME	KNOWLEDGE	SKILLS	BEHAVIOUR
Butter and milk fat K18	Butter and milk fat technology. Butter manufacture. Yellow fat and dairy spread manufacture. Ice cream manufacture. Dairy dessert manufacture. (K18)	N/A	N/A

Written test - TestExamination

KSBS GROUPED BY THEME	KNOWLEDGE	SKILLS	BEHAVIOUR
Whey K19	The chemistry of whey protein. Whey processing techniques and technology. (K19)	N/A	N/A

Written test - TestExamination

KSBS GROUPED BY THEME	KNOWLEDGE	SKILLS	BEHAVIOUR
Dairy automation K29	Dairy automation and process control. Control systems. Instrumentation. Control theory principles. Machine communications and networking. Integrated control and automation systems. Digital manufacturing. Dairy industry automated processes. (K29)	N/A	N/A

Grading

Project report and presentation with questions

Fail - does not meet pass criteria

THEME KSBs	PASS **Apprentices must demonstrate all the pass descriptors**	DISTINCTION **Apprentices must demonstrate all the pass descriptors and all of the distinction descriptors**
Data, information, and concepts K25 S8 S12	Analyses, interprets, and evaluates the collected data, scientific and technology information, concepts, and ideas including use of statistical methods to inform knowledge and draw conclusions to support the task. Applies extended knowledge of underlying concepts and principles to support the task. (K25, S8, S12)	Demonstrates how the data, scientific and technology information, concepts, and ideas collectively support (validate) their conclusions. (S12)
Problem solving and continuous improvement K23 K24 S14 S15	Applies problem solving and fault-finding techniques to identify and define the issue(s). Proposes solutions that have the potential to address the problem(s). Applies continuous improvement techniques to support the project. Uses the outcomes of those tools to inform their decisions. Generates and makes a recommendation(s) that has the potential to make a viable improvement. (K23, K24, S14, S15)	Analyses and evaluates the actual or potential value of a specific problem solving or improvement suggestion. (K23, K24, S14, S15)
Environment and sustainability K27 S5 S6 B2	Complies with environmental regulations and management systems and applies and promotes established sustainable working practices (K27, S5, S6, B2)	Identifies and promotes ideas for new viable working practices that have the potential to improve sustainability. (S6, B2)
Working with others K2 K20	Involves different teams, working autonomously and escalating as	Uses behavioural insights to modify approach to stakeholders

K31 K34 S19 S21 B6 B7	required, in line with their remit. (K2, B6) Negotiates with and influences others, managing conflict and promoting inclusion, to reach collaborative outcomes. (K20, K34, S21, B7) Uses verbal and written communicate techniques suitable for the context, adapting style and use of terminology to suit the audience. Uses industry terminology correctly. (K31, S19)	preferred working style. (K20, S21, B7)
Project and change management K21 K22 S13 S16 B4 B5	Applies changes to dairy processing unit operations to meet required outcome, taking responsibility for the quality of the work and enabling others to work to high standards for example, coaching or supporting others, recognising and supporting the needs of others. (K21, S13, B4) Uses project management techniques to plan and prioritise tasks, organise resources, manage stakeholders, and manage risk; responding and adapting to work demands and situations to deliver the project. (K22, S16, B5)	Evaluates their approach in conjunction with stakeholders to identify improvements that could be applied to project or change management in the future. (K21, K22, S13, S16, B5)
Presentation S20 B3	Creates and delivers a structured and clear presentation with supporting material suitable for the context, presenting a professional image. (S20, B3)	N/A

Professional discussion underpinned by a portfolio of evidence

Fail - does not meet pass criteria

THEME KSBs	PASS Apprentices must demonstrate all the pass descriptors	DISTINCTION Apprentices must demonstrate all the pass descriptors and all of the distinction descriptors
Dairy industry and business considerations K1 B8	Explains the dairy industry structure, financial considerations, and ethical best practices. Discusses how they have acted as an ambassador for the industry. (K1, B8)	N/A
Compliance K7 S1 S2 S3 S4 B1	Explains how they have taken personal responsibility for and promoted food safety and health and safety through: • the application of food safety management systems and food and dairy hygiene practice principles • compliance with food safety and health and safety regulations (K7, S1, S2, S3, S4, B1)	Applies food safety enhancements to improve the quality culture environment. (S1, S2, B1)
Quality assurance K11 S7	Describes how they have applied quality control processes to contribute to the quality assurance function, explaining factors that affect the QMP. (K11, S7)	Analyses and evaluates applied quality assurance processes in terms of costs and benefits to production operations. (K11, S7)
Scientific concepts, principles and techniques S9 S10	Explains how they have identified, reviewed and evaluated, and selected scientific techniques, procedures and methods to meet the needs of new and different areas of work. (S9) Explains how they have applied scientific techniques, procedures, and methods correctly to undertake tasks. (S10)	N/A
Engineering concepts and	Describes how they have applied engineering concepts and	Evaluates and validates performance against hygienic

principles K13 S11	principles to analyse dairy performance, explaining the basic physical and hygienic design principles of diary process engineering. (K13, S11)	design principles. (K13, S11)
Environmental impact K28 S17	Describes how they have conducted environmental impact assessments, explaining environmental audit requirements. (K28, S17)	N/A
Innovation K15	Explains given product development processes: • recipe development • specifications • market gap identification • acceptance testing and process design • packaging requirements • nutrition and organoleptic characteristics (K15)	Evaluates the inter-connections between development processes to ensure the product meets the needs of stakeholders. (K15)
Information technology K30 S22	Describes how they have used information technology for different purposes, explaining how they comply with General Data Protection Regulation (GDPR) and cyber security. (K30, S22)	N/A
Technical written content K32 S18	Describes different types of technical written content they have developed, explaining how they use report writing techniques to ensure it is suitable for the context. (K32, S18)	Gives examples of producing reports that are based on complex and multiple inputs or sources. (K32, S18)
Workplace training and development K33 S23 B9	Describes how they identify their own training needs and coach others using different techniques to meet the identified need.	N/A

| | Describes CPD they have undertaken and plans for CPD to enhance competence. Explains what the impact of their CPD has been and how it has benefited others and the business.

(K33, S23, B9) | |

Written test

Fail - does not meet pass criteria

THEME KSBs	PASS Apprentices must demonstrate all the pass descriptors
Manufacturing operations K3	Understands Good Manufacturing Practice (GMP). Understands production and operational planning concepts. (K3)
Health and safety K4	Understands health and safety factors and their importance. (K4)
Food and dairy safety K5	Understands food and dairy safety factors and their importance. (K5)
Food safety legislation K6	Understands key features of given food safety legislation and identifies sources of information for legislation changes. (K6)
Dairy chemistry K8	Understands principles of dairy chemistry in relation to chemical properties, compositional milk and dairy product analysis, or quality testing of milk and diary products. (K8)
Dairy microbiology K9	Understands given diary microbiology factors and practices or techniques. (K9)
Milk and dairy products K10	Understands the milk and dairy product factors and considerations. (K10)
Cleaning, disinfection, and sterilisation K12	Understands required cleaning, disinfection, and sterilisation techniques and related considerations. (K12)
Dairy supply chain K26	Understands the diary supply chain factors and considerations. (K26)
Operations K14	Understands the principles of given food industry unit operation and how they relate to other operations. (K14)
Milk processing K16	Understands milk processing from end to end, new concepts in processing and by-products. (K16)
Cheese and fermented products K17	Understands cheese and fermented product technology and products. (K17)
Butter and milk fat K18	Understands butter and milk fat technology and manufacture for given product. (K18)

Whey K19	Understands the chemistry of whey protein, whey processing techniques and technology. (K19)
Dairy automation K29	Understands given diary automation and process control factors. (K29)

Overall EPA grading

The EPA methods contribute equally to the overall EPA pass grade.

Performance in the EPA will determine the apprenticeship grade of:

- fail

- pass

- merit

- distinction

Independent assessors must individually grade the project report and presentation with questions, professional discussion underpinned by a portfolio of evidence and written test according to the requirements set out in this EPA plan.

EPAOs must combine the individual assessment method grades to determine the overall EPA grade.

An apprentice who fails one or more assessment method will be awarded an overall EPA fail.

An apprentice must achieve at least a pass in all the EPA methods to get an overall pass. To achieve a merit, the apprentice must achieve a distinction in one assessment method (report and presentation with questions or professional discussion underpinned by a portfolio of evidence) and a pass in the other assessment methods. To achieve a distinction, the apprentice must achieve a distinction in the report and presentation with questions and the professional discussion underpinned by portfolio, and a pass in the written test.

Grades from individual assessment methods should be combined in the following way to determine the grade of the EPA overall.

PROJECT REPORT AND PRESENTATION WITH QUESTIONS	PROFESSIONAL DISCUSSION UNDERPINNED BY A PORTFOLIO OF EVIDENCE	WRITTEN TEST	OVERALL GRADING
Any grade	Any grade	Fail	Fail
Any grade	Fail	Any grade	Fail
Fail	Any grade	Any grade	Fail
Pass	Pass	Pass	Pass
Distinction	Pass	Pass	Merit
Pass	Distinction	Pass	Merit
Distinction	Distinction	Pass	Distinction

Re-sits and re-takes

An apprentice who fails one or more EPA method(s) can take a re-sit or a re-take at the employer's discretion. The apprentice's employer needs to agree that a re-sit or re-take is appropriate. A re-sit does not need further learning, whereas a re-take does.

An apprentice should have a supportive action plan to prepare for a re-sit or a re-take.

The employer and EPAO agree the timescale for a re-sit or re-take. A re-sit is typically taken within 2 months of the EPA outcome notification. The timescale for a re-take is dependent on how much re-training is required and is typically taken within 4 months of the EPA outcome notification.

If the apprentice fails the project assessment method, they will be required to amend the project output in line with the independent assessor's feedback. The apprentice will be given 4 weeks to rework and submit the amended report.

Failed EPA methods must be re-sat or re-taken within a 6-month period from the EPA outcome notification, otherwise the entire EPA will need to be re-sat or re-taken in full.

Re-sits and re-takes are not offered to apprentices wishing to move from pass to a higher grade.

An apprentice will get a maximum EPA grade of pass for a re-sit or re-take, unless the EPAO determines there are exceptional circumstances.

Roles and responsibilities

ROLES	RESPONSIBILITY
Apprentice	As a minimum, apprentices should: • participate in and complete on-programme training to meet the KSBs as outlined in the occupational standard for a minimum of 12 months • undertake 20% off-the-job training as arranged by the employer and training provider • understand the purpose and importance of EPA • undertake the EPA including meeting all gateway requirements
Employer	As a minimum, employers must: • select the EPAO and training provider • work with the training provider (where applicable) to support the apprentice in the workplace and to provide the opportunities for the apprentice to develop the KSBs • arrange and support a minimum of 20% off-the-job training to be undertaken by the apprentice • decide when the apprentice is working at or above the level required by the occupational standard and so is ready for EPA • ensure that all supporting evidence required at the gateway is submitted in accordance with this EPA plan • remain independent from the delivery of the EPA • confirm arrangements with the EPAO for the EPA (who, when, where) in a timely manner (including providing access to any employer-specific documentation as required, for example company policies) • ensure that the EPA is scheduled with the EPAO for a date and time which allows appropriate opportunity for the apprentice to meet the KSBs • ensure the apprentice is well prepared for the EPA • require the training provider and EPAO to ensure the EPA is booked in a timely manner Post-gateway, employers must: • confirm arrangements with the EPAO for the EPA (who, when, where) in a timely manner (including providing

	access to any employer-specific documentation as required, for example company policies)
	• ensure that the EPA is scheduled with the EPAO for a date and time which allows appropriate opportunity for the KSBs to be met
	• remain independent from the delivery of the EPA
	• ensure the apprentice is given sufficient time away from regular duties to prepare for, and complete all post-gateway elements of the EPA, and that any required supervision during this time (as stated within this EPA plan) is in place
	• where the apprentice is assessed in the workplace, ensure that the apprentice has access to the resources used on a daily basis
	• pass the certificate to the apprentice upon receipt from the EPAO
EPAO	As a minimum, EPAOs must:
	• conform to the requirements of this EPA plan and deliver its requirements in a timely manner
	• conform to the requirements of the Register of End-Point Assessment Organisations (RoEPAO)
	• conform to the requirements of the external quality assurance provider (EQAP) for this apprenticeship standard
	• understand the occupational standard
	• make all necessary contractual arrangements, including agreeing the price of the EPA
	• develop and produce assessment materials including specifications and marking materials (for example mark schemes, practice materials, training material)
	• appoint suitably qualified and competent independent assessors and oversee their working
	• appoint administrators (and invigilators where required) to administer the EPA as appropriate
	• provide training for independent assessors in terms of good assessment practice, operating the assessment tools and grading
	• provide adequate information, advice and guidance documentation to enable apprentices, employers and training providers to prepare for the EPA

- arrange for the EPA to take place, in consultation with the employer

- where the apprentice is not assessed in the workplace, ensure that the apprentice has access to the required resources and liaise with the employer to agree this if necessary

- develop and provide appropriate assessment recording documentation to ensure a clear and auditable process is in place for providing assessment decisions and feedback to all relevant stakeholders

- have no direct connection with the apprentice, their employer or training provider. In all instances, including when the EPAO is the training provider (i.e. HEI), there must be no conflict of interest

- have policies and procedures for internal quality assurance (IQA), and maintain records of regular and robust IQA activity and moderation for external quality assurance (EQA) purposes

- deliver induction training for independent assessors, and for invigilators and/or markers (where used)

- undertake standardisation activity on this apprenticeship standard for all independent assessors before they conduct an EPA for the first time, if the EPA is updated and periodically as appropriate (a minimum of annually)

- manage invigilation of apprentices in order to maintain security of the assessment in line with the EPAO's malpractice policy

- verify the identity of the apprentice being assessed

- use language in the development and delivery of the EPA that is appropriate to the level of the occupational standard

Pre-gateway, EPAOs must:

- make all necessary contractual arrangements, including agreeing the price of the EPA

- provide adequate information, advice and guidance documentation to enable apprentices, employers and training providers to prepare for the EPA

- arrange for the EPA to take place, in consultation with the employer.

At the Gateway, EPAOs must:

	• confirm all gateway requirements have been met as quickly as possible. Post-gateway, EPAOs must: • where the apprentice is not assessed in the workplace, ensure that the apprentice has access to the required resources and liaise with the employer to agree this if necessary
Independent assessor	As a minimum, independent assessors must: • have the competence to assess the apprentice at this level and hold any required qualifications and experience in line with the requirements of the independent assessor as detailed in the IQA section of this EPA plan • understand the occupational standard and the requirements of this EPA • have, maintain and be able to evidence, up-to-date knowledge and expertise of the subject matter • deliver the end-point assessment in-line with the EPA plan • comply with the IQA requirements of the EPAO • have no direct connection or conflict of interest with the apprentice, their employer or training provider; in all instances, including when the EPAO is the training provider (i.e. HEI) • attend induction training • attend standardisation events when they begin working for the EPAO, before they conduct an EPA for the first time and a minimum of annually on this apprenticeship standard • assess each assessment method, as determined by the EPA plan, and without extending the EPA unnecessarily • assess against the KSBs assigned to each assessment method, as shown in the mapping of assessment methods and as determined by the EPAO, and without extending the EPA unnecessarily • make all grading decisions • record and report all assessment outcome decisions, for each apprentice, following instructions and using assessment recording documentation provided by the EPAO, in a timely manner • use language in the development and delivery of the EPA that is appropriate to the level of the occupational

	standard
	• mark open (constructed) test answers accurately according to the EPAO's mark scheme and procedures
Training provider	As a minimum, training providers should: • work with the employer and support the apprentice during the off-the-job training to provide the opportunities to develop the knowledge, skills and behaviours as listed in the occupational standard • conduct training covering any knowledge, skill or behaviour requirement agreed as part of the Commitment Statement (often known as the Individual Learning Plan) • monitor the apprentice's progress during any training provider led on-programme learning • advise the employer, upon request, on the apprentice's readiness for EPA • remain independent from the delivery of the EPA. Where the training provider is the EPAO (i.e. a HEI), there must be procures in place to mitigate against any conflict of interest.
Marker	As a minimum, markers should: • attend induction training as directed by the EPAO • have no direct connection or conflict of interest with the apprentice, their employer or training provider in all instances including when the EPAO is the training provider (i.e. HEI) • mark test answers accurately according to the EPAO's mark scheme and procedures
Invigilator	As a minimum, invigilators should: • attend induction training as directed by the EPAO • have no direct connection or conflict of interest with the apprentice, their employer or training provider; in all instances, including when the EPAO is the training provider (i.e. HEI) • invigilate and supervise apprentices during tests and in breaks during assessment methods to prevent malpractice in accordance with the EPAO's invigilation procedures

Reasonable adjustments

The EPAO must have reasonable adjustments arrangements for the EPA.

This should include:

- how an apprentice qualifies for reasonable adjustment

- what reasonable adjustments may be made

Adjustments must maintain the validity, reliability and integrity of the EPA as outlined in this EPA plan.

Internal quality assurance (IQA)

Internal quality assurance refers to how EPAOs ensure valid, consistent and reliable EPA decisions. EPAOs must adhere to the requirements within the roles and responsibilities section and:

- have effective and rigorous quality assurance systems and procedures that ensure fair, reliable and consistent EPA regardless of employer, place, time or independent assessor

- appoint independent assessors who are competent to deliver the EPA and who:

  - have recent relevant experience of the occupation or sector to at least occupational level 5 gained in the last 3 years or significant experience of the occupation or sector

- operate induction training for anyone involved in the delivery and/or assessment of the EPA

- provide training for independent assessors in good assessment practice, operating the assessment tools and making grading decisions

- provide ongoing training for markers and invigilators

- provide standardisation activity for this apprenticeship standard for all independent assessors:

  - before they conduct an EPA for the first time

  - if the EPA is updated

  - periodically as appropriate (a minimum of annually)

- conduct effective moderation of EPA decisions and grades

- conduct appeals where required, according to the EPAO's appeals procedure, reviewing and making final decisions on EPA decisions and grades

- have no direct connection with the apprentice, their employer or training provider. In all instances, including when the EPAO is the training provider (for example a higher education institution)

Value for money

Affordability of the EPA will be aided by using at least some of the following:

- completing applicable assessment methods online (for example computer-based assessment)

- utilising digital remote platforms to conduct applicable assessment methods

- assessing multiple apprentices simultaneously where the method of assessment permits this

- using the employer's premises

- conducting assessment methods on the same day

Professional recognition

This apprenticeship standard aligns with The Science Council for Registered Scientist (RSci). Upon successful completion of the apprenticeship and upon receipt of the apprenticeship certificate, individuals are eligible to apply for RSci through a shortened application route. Individuals need to be a member of a professional body that is licensed by the Science Council to be awarded this status. Further information is on the Science Council's website.

Map KSBs to assessment methods

KNOWLEDGE	ASSESSMENT METHODS
K1 The dairy industry structure. Financial considerations. Ethical business practices.	Professional discussion underpinned by a portfolio of evidence
K2 Different teams and functions involved in dairy production. Dairy technologist role. Limits of scope of practice: when to seek input from others and when to escalate.	Project report and presentation with questions
K3 Good Manufacturing Practice (GMP). Production and operational planning concepts.	Written test
K4 Health and safety. Health and Safety at Work Act – responsibilities. Health and safety culture. Control of Substances Hazardous to Health (CoSHH). The Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR). Manual handling. Personal Protective Equipment (PPE). Types of hazards. Risk assessments, mitigation methods, and method statements (safe systems of work).	Written test
K5 Principles of food and dairy safety. Allergenic control. Good Hygienic Practice (GHP). Microbiology and food borne illnesses. Biological, physical, allergenic (cross-contamination), and chemical contamination of dairy and related products. Food storage, temperature control and preservation of dairy products. Hygienic design, construction and maintenance of food premises and equipment, and their cleaning and disinfection. Pest control. Personal hygiene and training requirements. Food safety culture. Traceability.	Written test
K6 Food safety legislation principles: Food Safety Act, Regulation (EC) 852/2004, The General Food Law Regulation (EC) 178/2002, The Food Safety and Hygiene (England) Regulations, The Food Hygiene (Scotland) Regulations, The Food Hygiene (Wales) Regulations, The Food Information to Consumers Regulations (EC)1169/2011, Food Information Regulations, Regulation (EC) No 2073/2005 on Microbiological criteria for foodstuffs, The Weights and Measures (Packaged Goods) Regulations. Sources of information for legislation changes.	Written test

K7 Food safety management control of dairy and related food systems: Hazard Analysis and Critical Control Points (HACCP), Threat Analysis of Critical Control Points (TACCP), and Vulnerability Assessment of Critical Control Points (VACCP).	Professional discussion underpinned by a portfolio of evidence
K8 Principles of dairy chemistry. Chemical properties. Compositional milk and dairy product analysis. Quality testing of milk and dairy products.	Written test
K9 Principles of dairy microbiology. Types of micro-organisms and their structure. Cultivation conditions and procedures. Aseptic conditions and Good Laboratory Practice (GLP): organisation and discipline within the laboratory. Hygiene monitoring and auditing. Laboratory analysis techniques. Indicator organisms. Interpretation of microbiological data as an indicator of risk.	Written test
K10 Milk and dairy derivatives as raw materials. Primary production. Dairy farming practice. Composition of milk and dairy produce. Additives. Dairy products as an ingredient in other foods and associated allergenic issues. Dairy alternatives (non-milk based ingredients).	Written test
K11 Function of quality assurance within the dairy industry. Quality assurance schemes and factors affecting the Quality Management Plan (QMP).	Professional discussion underpinned by a portfolio of evidence
K12 Cleaning, disinfection, and sterilisation. Different techniques: chemical, heat, steam technology and ultraviolet - when they should be used. Components of Clean In Place (CIP). New developments in cleaning technology. Environmental impact of cleaning. Cleaning validation, verification, and optimisation techniques.	Written test
K13 Basic physical and hygienic design principles of dairy process engineering: mass and energy balances, modes of thermal transfer, principles of fluid flow, and rheology (deformation and flow of materials - solids and liquids).	Professional discussion underpinned by a portfolio of evidence

K14 Principles of food industry unit operations. Preservation operations. Dairy industry unit operations. Factory service operations.	Written test
K15 Product development processes: recipe development, specifications, market gap identification, acceptance testing and process design, packaging requirements, and nutrition and organoleptic characteristics.	Professional discussion underpinned by a portfolio of evidence
K16 Milk processing: end-to-end. New concepts in milk processing. By-products.	Written test
K17 Cheese and fermented product technology. Cheese and cheese related products. Yogurt and related products. Soured creams and crème fraiche.	Written test
K18 Butter and milk fat technology. Butter manufacture. Yellow fat and dairy spread manufacture. Ice cream manufacture. Dairy dessert manufacture.	Written test
K19 The chemistry of whey protein. Whey processing techniques and technology.	Written test
K20 Leadership and management techniques: influencing, negotiation, and conflict management.	Project report and presentation with questions
K21 Change management principles and techniques.	Project report and presentation with questions
K22 Project management roles and techniques: planning, prioritising, organising, stakeholder management, and risk management.	Project report and presentation with questions
K23 Problem solving and fault finding: 5 whys, root cause analysis, Failure Mode Effects Analysis (FMEA).	Project report and presentation with questions

K24 Continuous improvement principles and techniques: Plan-do-check-act (PDCA), Lean, 6 Sigma, and Statistical Process Control (SPC). Lean manufacturing tools. Process mapping.	Project report and presentation with questions
K25 Data analysis techniques. Data analysis and reporting systems.	Project report and presentation with questions
K26 Dairy supply chain: mapping and risk management. World dairy economic drivers. Milk and dairy product supply and demand factors. Food security.	Written test
K27 Environmental Protection Act and environmental management systems.	Project report and presentation with questions
K28 Measuring environment impact and environmental audit requirements.	Professional discussion underpinned by a portfolio of evidence
K29 Dairy automation and process control. Control systems. Instrumentation. Control theory principles. Machine communications and networking. Integrated control and automation systems. Digital manufacturing. Dairy industry automated processes.	Written test
K30 Information technology: Management Information Systems (MIS), spreadsheets, presentation, word processing, email, virtual communication and learning platforms. General Data Protection Regulation (GDPR). Cyber security.	Professional discussion underpinned by a portfolio of evidence
K31 Communication techniques.	Project report and presentation with questions
K32 Report writing techniques.	Professional discussion underpinned by a portfolio of evidence
K33	Professional discussion underpinned by a

Workplace training and development techniques: coaching and transfer of knowledge.	portfolio of evidence
K34 Equality, diversity, and inclusion. Unconscious bias.	Project report and presentation with questions

SKILL	ASSESSMENT METHODS
S1 Apply food safety management systems.	Professional discussion underpinned by a portfolio of evidence
S2 Apply food and dairy hygiene practice principles.	Professional discussion underpinned by a portfolio of evidence
S3 Comply with food safety regulations and procedures.	Professional discussion underpinned by a portfolio of evidence
S4 Comply with health and safety regulations, guidelines, and procedures.	Professional discussion underpinned by a portfolio of evidence
S5 Comply with environmental regulations, guidelines, and procedures.	Project report and presentation with questions
S6 Apply sustainable working practices. For example, efficient use of resources, waste minimisation.	Project report and presentation with questions
S7 Apply quality control processes.	Professional discussion underpinned by a portfolio of evidence
S8 Apply extended knowledge of underlying dairy concepts.	Project report and presentation with questions
S9 Identify, review and evaluate, and select scientific techniques, procedures, and methods in the context of new and different areas of work.	Professional discussion underpinned by a portfolio of evidence
S10 Apply scientific techniques, procedures, and methods to undertake tasks.	Professional discussion underpinned by a portfolio of evidence
S11 Apply engineering concepts and principles to analyse dairy performance.	Professional discussion underpinned by a portfolio of evidence

S12 Collect data. Analyse, interpret, and evaluate data, scientific and technology information, concepts, and ideas including use of statistical methods.	Project report and presentation with questions
S13 Apply changes to dairy processing unit operations.	Project report and presentation with questions
S14 Apply problem solving techniques, identifying issues. Propose solutions to problems.	Project report and presentation with questions
S15 Use continuous improvement techniques and make recommendations.	Project report and presentation with questions
S16 Apply project management techniques: planning and prioritising tasks, organising resources, managing stakeholders and risk management.	Project report and presentation with questions
S17 Conduct environmental impact assessments.	Professional discussion underpinned by a portfolio of evidence
S18 Develop technical written content. For example, operating procedures, working instructions, and reports.	Professional discussion underpinned by a portfolio of evidence
S19 Communicate with others for example, colleagues, customers, and stakeholders. Use industry terminology where appropriate.	Project report and presentation with questions
S20 Create and deliver presentations.	Project report and presentation with questions
S21 Negotiate with and influence colleagues or stakeholders; manage conflict.	Project report and presentation with questions
S22 Use information and digital technology.	Professional discussion underpinned by a portfolio of evidence

S23 Identify training needs. Coach individuals.	Professional discussion underpinned by a portfolio of evidence

BEHAVIOUR	ASSESSMENT METHODS
B1 Take personal responsibility for and promote food safety and health and safety.	Professional discussion underpinned by a portfolio of evidence
B2 Take personal responsibility for and promote sustainable working practices.	Project report and presentation with questions
B3 Act in a professional manner.	Project report and presentation with questions
B4 Take responsibility for the quality of work and enable others to work to high standards. For example, decisive, self-reliant, and motivated.	Project report and presentation with questions
B5 Respond and adapt to work demands and situations.	Project report and presentation with questions
B6 Recognise limitations, seek input from others and escalate issues when required.	Project report and presentation with questions
B7 Collaborate with others for example, within teams, across disciplines, and external stakeholders, promoting inclusion.	Project report and presentation with questions
B8 Ambassador for the dairy industry.	Professional discussion underpinned by a portfolio of evidence
B9 Committed to maintaining and enhancing competence of self and others through Continued Professional Development (CPD).	Professional discussion underpinned by a portfolio of evidence