T Level Technical Qualification in Science

Occupational specialism assessment (OSA)

Food Sciences

Assignment 4 - Distinction

Guide standard exemplification materials

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Occupational specialism assessment

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Food Sciences

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Contents

Introduction

The material within this document relates to the Food Sciences occupational specialism sample assessment. These exemplification materials are designed to give providers and students an indication of what would be expected for the lowest level of attainment required to achieve a pass or distinction grade.

The examiner commentary is provided to detail the judgements examiners will undertake when examining the student work. This is not intended to replace the information within the qualification specification and providers must refer to this for the content.

In assignment 4, the student must analyse and interpret data and identify opportunities for improvement.

After each live assessment series, authentic student evidence will be published with examiner commentary across the range of achievement.

Task 1: collect, analyse and interpret food production data

Your new factory manager wants to have a better understanding of your site. They have asked you to analyse relevant data on customer requirements, food safety, productivity and quality and present it to them in a report.

You will be provided with the raw data you will need in a spreadsheet format. You may use spreadsheet software, or any other appropriate software to analyse and present this data for your report.

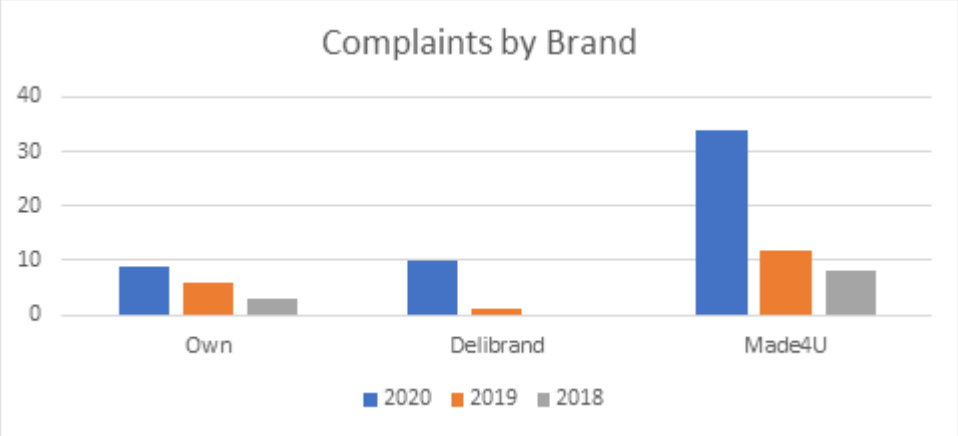
(24 marks)
2 hours 30 minutes

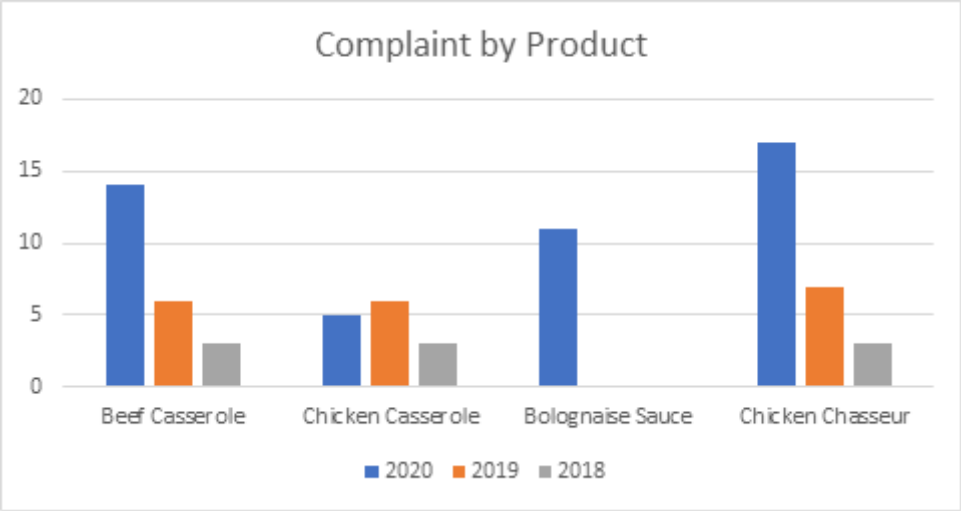
Your report must include, as a minimum:

- an analysis of the data to identify 4 trends
- presentation of the data clearly and unambiguously
- the identification of any out of tolerance results and corrective actions applied
- the identification of any errors, omissions, or areas for further investigation in the records

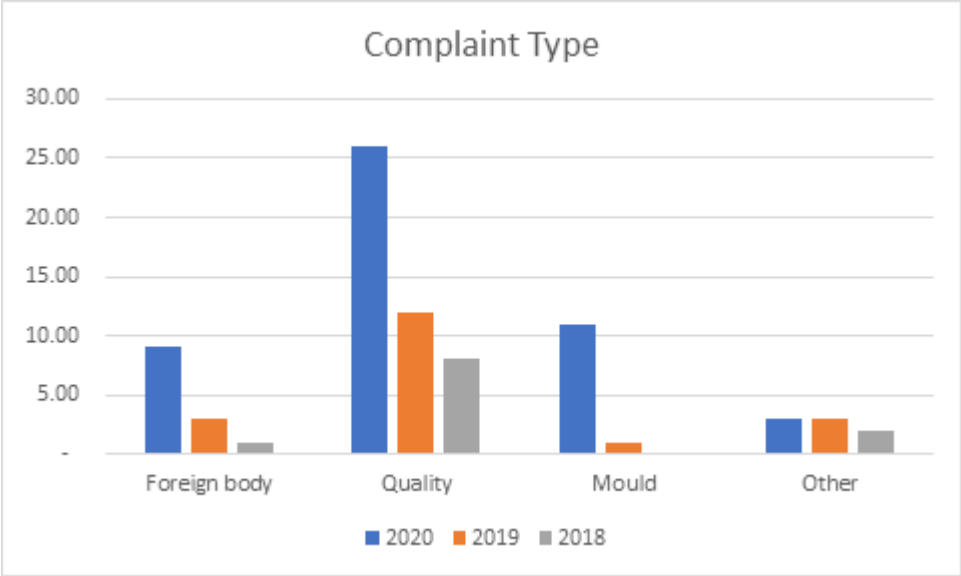
Student evidence

Complaints data - food safety and quality





The rising number of complaints is of concern as to date we have received 34 from one customer alone. There are numerous issues on site and this can be categorised into 4 key trends- food safety, quality, suppliers and process.



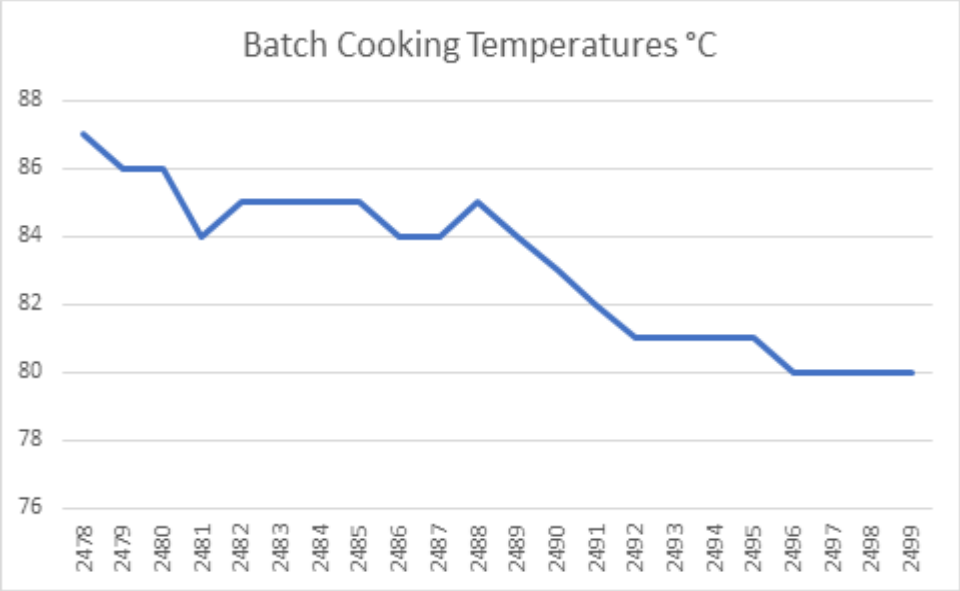
Food Safety

1. We have received 4 foreign body complaints for the beef casserole and we have received 11 complaints of mould for the chicken casserole. Both issues must be investigated fully and a root cause analysis carried out to identify the cause.
2. There was an issue with batch numbers 2482, 2488, 2493 in the blast chiller on 15th, 17th and 19th of April respectively. All batches were chicken casserole and did not achieve a temperature <5°C within 120 minutes and had to be cooled for a further period. All batches exceeded the time period. Batch 2482 took 180 minutes, 2488 took 138 and 2493 took 156 minutes. Batch 2482 was also not checked during the cooling period. It is essential that a clear procedure and monitoring sheet are drawn up and all operators trained as this is a clear food safety breach.
3. Allergen procedures have not been correctly followed by BFG and Sapphire Supplies and this must be

addressed as a matter of urgency with the suppliers as it could lead to incorrect labelling of products.

Quality

1. We have seen a rise in quality complaints - a total of 21 during the period. The cooked temperature of the product should be 80°C and during the period 13–19th April it was constantly above this figure. On the 13th April batch 2478 had achieved a temperature of 87°C. The temperature was not reduced to 80°C until the last 4 batches 2496 and 2497 from the 20th April and 2498 and 2499 which was produced on 21st April. This will naturally lead to a rise in the number of quality complaints we have received as the texture of the meat with have change and it is likely that the sauce will have thickened so the meal would be drier.
2. Issues were raised during taste panel for batch 2483 on 15th April and 2490 on the 17th April. Both batches



were beef casserole and concerned the quality of the beef which had excessive fat in batch 2483 and gristle was noted in batch 2490. Both issues were raised with the supplier.

3. It is also of concern that the packing record for batch 2483 does not appear to have samples sent for the taste panel. There also doesn't appear to have been a taste panel, or there is no record of one, for batches 2478, 2479 and 2491–2499. This may also have contributed to the rise in quality complaints.

Suppliers

1. There is a goods received note GRN for a delivery on 6th April from BFG for both celery and salt. These items should not have been accepted on the same goods received note as celery is an allergen and should have been recorded separately.
2. On 6th April Sapphire Supplies sent chicken stock powder which contained gluten, again an allergen, but on 14th April the chicken stock powder was not listed as containing gluten and this warrants further investigation, and the raw materials specification needs to be checked.
3. There is also an issue with receiving dry goods out of rotation from BFG with beef stock powder received on 6th April with a best before date of January 24th and on 14th April with a best before date of December 22nd. This needs to be raised as a corrective action with the supplier.

Process

1. Goods in records are incomplete with checkers' names missing and some accept or reject not marked and the temperature of the vegetable stock powder, which is an ambient product, was taken for some reason on 16th April as was the swede on the 8th April. Although it is good to see that the pest infestation of the carrots from Diamond Produce was picked up by the QA on 14th April and the delivery was rejected.
2. Packing targets are rarely met and the smaller the batch the longer it appears to take to pack. Production should focus on maximising packs boxed per minute to drive up an increase productivity levels.
3. Chiller temperatures within goods in, production and dispatch should not exceed 5°C at any time. Yet on 5 occasions in goods in, 3 in production and 2 in dispatch it has reached 6°C and no corrective action has been taken. There are also no checker's initials on this monitoring record nor do the time stamps make much sense.

Further investigation required

1. Root cause analysis of food safety complaints both for foreign body and mould. There is also insufficient information concerning the foreign body contamination and it would be helpful to see more information on this (for example, was it hair, metal, plastic).
2. The following supplier issues to be addressed: BFG – allergen procedure and stock rotation; Sapphire Supplies – allergen procedure and raw material specification sheets; Diamond Produce – pest infestation of carrots
3. Incomplete documentation throughout process. Written procedures should be in place for each task and all personnel need to be trained to a competent standard and this training should be recorded in their training files. Do the written procedures exist, how are individuals trained, are they trained against the current version of the procedure and is it recorded in their training file?
4. All monitoring records should be updated to include a signature for whoever carried out the task. Why isn't this in place?
5. Packing targets are not being met. Why not? Is it a personnel issue or machinery, packaging.

Task 2: continuous improvement opportunities

Based on your analysis:

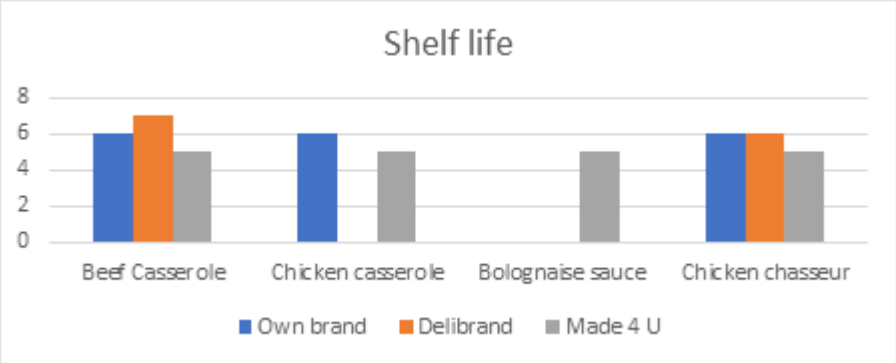
- describe 3 opportunities for continuous improvement, such as process improvements or cost savings
- discuss potential technological solutions to reduce any errors in data collection, including the advantages and disadvantages of each suggested solution

(18 marks)
2 hours

Student evidence

Opportunities for CI

1. Shelf life varies from customer to customer - would suggest increasing all beef casserole to 7 days and chicken casserole and chicken chasseur to 6 days. This would result in a cost saving as production time would be reduce through the cooking and cooling process. The only additional step required would be the addition of white wine concentrate for the Delibrand chicken chasseur. Increasing all product to the same shelf life wouldn't impact on food safety.



2. Packs are consistently overweight during the 5 day period 13–17th April a total of 241g was given away. This represents a potential loss to the business of 12.5kg per annum. It is recommended that average weights are set to reduce this loss in order to produce a cost saving.
3. Documentation is often incomplete. For example, there is little data held on customer complaints beyond the type of complaint and monitoring records such as the cooling, refrigerator and taste panel checks. All records should be signed to enable us to fully investigate if things go wrong. Also standardising documentation would make it easier for everyone to follow.
4. Productivity targets are not consistently being met. During the 5 day period 13–17th April the production target was set at 2785 packs. After deducting the 32 packs required for taste panels, assuming the 2 packs for each batch were taken, and the 7 packs which were above target, we're left with a shortage of 190 packs for our customers. It is therefore likely that we failed to fulfil our orders that week and this can lead to increased costs if we need to refund customers.
5. Packing times vary greatly on one occasion on 13th April it averaged 2 minutes 21 seconds per pack for 17 packs and on 15th it averaged 2 minutes per pack for 2 packs. However, on the 16th and 17th April the average time was 13 seconds for 478 packs and 12 seconds per pack for 462 packs. It is likely with further investigation a time could be set for packing of around 25 seconds per pack which would increase productivity and potential reduce labour costs during slower periods.

Technological solutions to reduce any errors in data collection

1. Remote temperature monitoring systems for chillers act as a virtual engineer to automatically alert us when anything goes wrong. In the goods in area the chiller temperature exceeded 5°C on 4 occasions, production 2 occasions and in dispatch on 2 occasions. Each time the temperature increases it has the capacity to affect any product or raw material which is held there. The chiller record time stamps are incorrect and there is no signature so we don't know who carried out the check. A remote monitoring system would provide data which is timely, so we can react if there's a fault and also it will be 100% accurate. However, this would require training to ensure all information is recoded correctly and training for supervisors to ensure the information can be extracted correctly and fully utilised for reporting purposes.
2. Data loggers - hand held data loggers can be used to check the temperature of the product, on 3 occasions the chicken casserole failed to cool within the allotted timeframe and on one of those occasions there was no intermediate check. The monitoring record had no signature and this is key data required for due diligence. A data logger would provide the accurate data at the right time. This would require training for both the operator and the QA team.
3. Complaints database - there is very little data appeared to be held for customer complaints a customer complaints database should be created containing the type of complaint and any information collated for any root cause investigation carried out and corrective actions which may have been implemented. This helps provide robust data to carry out trend analysis and prevent reoccurrence. This will help demonstrate due diligence and meet our requirements under industry codes such as BRCGS, FSSC22000 and GFSI and customer codes of practice. This will require internal or external IT expertise to build this system, which will take time and money and all QA resource will need to be thoroughly trained in order to collate and manipulate the data.
4. The use of resource planning tools would help plan production and packing more in line with customer requirements and if the shelf life of each product was standardised that would enable production to make better use of production time, saving money on efficiency of raw material usage and reducing wasted time in packing. Cost and training are 2 issues which would need to be overcome.
5. It is highly recommended electronic check weighers are introduced to remove the amount of wastage being sent out in overweight packs. This would help save on wastage and also help us meet our specified quantities under the Weights and Measures Act. The cost may be an issue but this would be offset from under fines which could be imposed by Trading Standards.

Examiner commentary

The student makes extensive use of relevant knowledge and has extensive understanding of the practices of the sector through the comprehensive use of information from various sources such as customer requirements, complaints and process flow with some documentation such as chiller temperatures, monitoring sheets and taste panel records. The student has also demonstrated a breadth of knowledge of the process by analysing not only the technical data but also productivity records such as packing times and packs produced.

The student has carried out a robust evaluation and this has led to the identification of 4 key trends – food safety (foreign body and mould), quality (overcooking, fat), supplier issues (poor allergen control, stock rotation and pest infestation) and areas of the process where it does not appear to have been correctly followed (incomplete documentation and failing to meet production targets).

The information has been presented both graphically and verbally and clearly split down to the key trends. Out of tolerance results such as chilling times, goods in checks and issues with supplier assurance were taken into account. Corrective actions that were taken have been identified and areas for further investigation have been highlighted.

The accurate analysis of this information has enabled the student to propose relevant follow-up actions such as signatures on monitoring records, written procedures, staff training, targets, and supplier assurance.

The student has made sound judgements to suggest 4 CI opportunities that could be undertaken, all of which could lead to substantial savings through standardisation of customer requirements, waste reduction either in time, productivity, or product weight. Such suggestions demonstrate the student's understanding of how a food business operates and would drive tangible improvements within a food operation and could lead to improved productivity and waste reduction and would lead to better compliance.

Overall grade descriptors

The performance outcomes form the basis of the overall grading descriptors for pass and distinction grades.

These grading descriptors have been developed to reflect the appropriate level of demand for students of other level 3 qualifications, the threshold competence requirements of the role and have been validated with employers within the sector to describe achievement appropriate to the role.

Occupational specialism overall grade descriptors:

Grade	Demonstration of attainment
Pass	The evidence is logical but displays minimal knowledge in response to the demands of the brief.
	The student makes some use of relevant knowledge and understanding of how it informs practices of the sector and demonstrates a limited understanding of perspectives or approaches associated with food science and food product development processes.
	The student makes adequate use of facts/theories/approaches/concepts/data and attempts to demonstrate breadth and depth of knowledge and understanding.
	The student is able to identify some information from appropriate sources and makes use of appropriate information/appraise relevancy of information and can combine information to make decisions and recommendations.
	The student makes minimal judgements/takes appropriate action/seeks clarification with guidance and is able to make limited progress towards solving non-routine problems in real life situations.
	The student attempts to demonstrate skills and knowledge of the relevant concepts and techniques reflected in a food science and/or food product development role and generally applies this across different contexts.
	The student shows adequate understanding of problems that have not been seen before, using limited knowledge to find solutions to problems and make justification for strategies for solving problems, explaining their reasoning.
Distinction	The evidence is precise, logical and provides a detailed and informative response to the demands of the brief.
	The student makes extensive use of relevant knowledge and has extensive understanding of the practices of the sector and demonstrates an understanding of the different perspectives/approaches associated with food science and food development processes.
	The student makes decisive use of facts/theories/approaches/concepts/data, demonstrating extensive breadth and depth of knowledge and understanding and selects highly appropriate skills/techniques/methods.
	The student is able to comprehensively identify information from a range of suitable sources and makes exceptional use of appropriate information/appraises relevancy of information and can combine information to make coherent decisions.
	The student makes well founded judgements/takes appropriate action/seeks clarification and guidance and is able to use that to reflect on real life situations in a food science and/or food development role.

	The student demonstrates extensive knowledge of relevant concepts and techniques reflected in a food science and/or food development role and precisely applies this across a variety of contexts and tackles unstructured problems that have not been seen before, using their knowledge to analyse and find suitable solutions to the problems.

Document information

The T Level Technical Qualification is a qualification approved and managed by the Institute for Apprenticeships and Technical Education.

Owner: Head of Assessment Design

Change History Record

Version	Description of change	Approval	Date of Issue
v1.0	Published final version.		June 2021
v1.1	NCFE rebrand		September 2021