

COURSE MANUAL

Quality Systems Operations

PDQ-10804

**Chair group Product Design & Quality Management (PDQ)
Chair group Operations Research & Logistics (ORL)**

May 2012

Wageningen University

Language of instruction:	English
Study load:	4 ECTS
Education activities:	12x2 hours class room lecture 5x4 hours practical training extensive (making assignments)
Schedule:	Weeks: 35-40 (7/5 – 15/6) Lectures: Monday (15.30) and Tuesday (15.30) – C7 Assignments: Wednesday (13.30) – PC86
Examination:	Exam: Friday 15/6 14.00 room C2 Re-exam: Wednesday 22/8 14.00 room C17
Type of written exam:	Open questions, closed book
Grading of course:	Written exam (80%) Report of assignments (20%)
Lecturers:	dr. ir. Kasper Hettinga (PDQ) prof. dr. ir. Jack van der Vorst (ORL) dr. Remco Germs (ORL)
Contact person:	dr. ir. Kasper Hettinga (PDQ) kasper.hettinga@wur.nl 0317-482401
Examiners:	dr. ir. Kasper Hettinga prof. dr. ir. Jack van der Vorst

Profile of the course

Quality and safety are essential conditions to each industry, company or establishment dealing with agricultural and food products. Different systems have been developed to assure the quality and safety of the foods produced. These foods are not made from start to finish in one company, but they are made in a food production chain, which involves many steps from primary production at the farm to consumer. Food quality assurance systems have therefore been developed to take into account the complete food production chain. This course will give an introduction into the principles behind effective operational quality systems in these complex food production chains.

Major theoretical topics of the course include:

- relation between food properties and quality attributes
- basic principles of operations management
- principles of major technological tools, methods, techniques in quality control and inspection
- introduction to major quality assurance standards (HACCP, ISO9001, ISO22000)
- traceability of food products in the food production chain

In addition, the course contains assignments related to these 5 topics. The assignment will serve as a basis for critical analysis of factors influencing the actual operation of the implemented quality system.

Learning outcomes

At the end of this course, students are expected to be able to:

- relate the (dynamics of) food properties to quality attributes
- know basic principles of operations management
- recognise major management processes in operational quality systems in food organisations
- use knowledge about major technological tools, methods, techniques in quality control and inspection
- understand principles and recognise restrictions of different quality assurance standards
- understand the major approaches to traceability of food products in complex food production chains

Learning materials and resources

Reader (available from WUR-shop / Kasper Hettinga)

Blackboard: course manual, hand-outs, assignments

The principal themes of the contents

The course is set up in 5 blocks:

1. *Food quality*; here the students will be introduced to food quality: how can quality be defined, how do dynamic processes in foods influence its quality, how does processing influence quality, what is the influence of complex food production chains on quality?
2. *Operations management*; managing the resources which are devoted to the production and delivery of products and services is called operations management. In this block, students will be introduced into the basic concepts of operations management: which activities in a company need to be managed to produce high quality products, what are the performance objectives of operations, what are similarities and what are differences between operations and companies?

3. *Quality control* (prevention); in this first block on quality control, the focus will be on the methods used in operational management in food industry to control quality: how are requirements set, how are sampling plans made, how can the processing be monitored? Also tools used for quality control are discussed.
4. *Quality assurance systems*; in this block, some of the most used food assurance systems in operational management will be discussed (amongst others HACCP, ISO9001): what are the properties of the systems, what are the differences and what is the overlap between these system, how can these systems be developed and implemented?
5. *Quality control* (traceability); if quality has not been controlled sufficiently and something has gone wrong products need to be recalled from the market place. This requires advanced tracking and tracing systems in the food production chain to detect infected products and withdraw those from the chain. How are requirements on traceability set, what are key issues in operations management to have optimal traceability, what are differences between dairy, meat and fruit & vegetables supply chains?

Educational (= teaching and learning) activities

The course is set up in 5 blocks as discussed above. Each block consists of:

- A chapter in the reader which the student should read before the lecture containing background information on the topic of the block
- A 2 hour lecture explaining the theory of the block's topic
- A 4 hour block consisting of presentations on the assignment, a lecture, and working on the new assignment.
- Finishing the assignment, making a report and preparing a presentation on the assignment

Mondays at 15.30, the presentations on the assignments will be done, followed by a final discussion of the block.

On Tuesdays, 2 hour lectures are given in which the theoretical background is explained.

On Wednesdays, the topic for the new assignment is explained, after which the remaining time will be used to work on the assignment.

In the other days, the assignment is finished and a report is prepared. Also, a presentation needs to be prepared by selected groups of student. Appendix A contains all information for the assignment (groups, presentation/feedback schedule, guidelines for reporting, etc.).

Examination

The examination of this course consists of two parts:

- Average mark for the reports on all 5 assignments (20%)
- Written exam (80%)

Outline and schedule of the programme of the course

Block	Date & time	Location	Activity	Lecturer
1 (35)	Mon 7/5 15.30-16.15	C7	Lecture: Introduction to course.	KH
	Tue 8/5 15.30-17.15	C7	Lecture: Dynamics of food quality	KH
	Wed 9/5 13.30-17.15	PC86	Assignment 1: The dairy production chain	KH
2 (36)	Mon 14/5 15.30-17.15	C7	Feedback assignment 1	KH
	Tue 15/5 15.30-17.15	C7	Lecture: Operations management	JvdV/RG
	Wed 16/5 13.30-17.15	PC86	Assignment 2: The differences in operational management of different food production chains	JvdV/RG
3 (37)	Mon 21/5 15.30-17.15	C7	Lecture: Quality control	KH
	Tue 22/5 15.30-17.15	C7	Feedback assignment 2	JvdV/RG
	Wed 23/5 13.30-17.15	PC86	Assignment 3: Acceptance sampling	KH
4 (38)	Mon 28/5		Whit Monday	
	Tue 29/5 15.30-17.15	C7	Feedback assignment 3 Lecture: Quality assurance system	KH
	Wed 30/5 13.30-17.15	PC86	Assignment 4: Quality assurance system	KH
5 (39)	Mon 4/6 15.30-17.15	C7	Feedback assignment 4	KH
	Tue 5/6 15.30-17.15	C7	Lecture: Traceability in food supply chains	JvdV/RG
	Wed 6/6 13.30-17.00	PC86	Assignment 5: How can tracking & tracing be applied in different production chain.	JvdV/RG
- (40)	Mon 11/6 15.30-17.15	C7	Presentations on assignment 5	JvdV
	Tue 12/6 15.30-17.15	C7	Questions hour	KH/JvdV
	Fri 15/6 14.00-17.00	C2	Exam	KH

* KH: Kasper Hettinga; JvdV: Jack van der Vorst; RG: Remco Germs

Appendix A – The assignment

You will have to make 5 assignments in groups of 4 students. On Wednesdays, the assignments are introduced. After an introduction, you can start to work on the assignment in room PC86. The lecturer will also be available during this Wednesday afternoon. On the next days, you can finish the assignment and write a report.

You will have to deliver a **hardcopy** of the report on Friday **before 17.00** by email to either Kasper Hettinga (kasper.hettinga@wur.nl) or Jack van de Vorst (jack.vandervorst@wur.nl). Please send the document either as word document or pdf document using the following name:

GroupX_AssignmentX.doc

(so for the report on assignment 3 by group 5, the file name would be Group5_Assignment3.doc)

Because of Ascension day, the report on assignment 2 can be submitted in two parts: part 1, containing the raw data which was collected should be delivered before Friday 17.00. The full report, including the analysis should be delivered Monday, before 15.30.

The front page of the report should state the assignment number, the group number, and the names of all participants of the group. If one of the group members did not contribute to the report, you should leave his/her name from the report, and notify Kasper Hettinga (kasper.hettinga@wur.nl) as soon as possible.

All 5 reports are graded separately. The average of the 5 marks for the reports will count for 20% on the total mark for the course. **If no report is handed in, the assignment will be graded with a 0.**

Each week, 4 groups will give a presentation and 4 groups are assigned to give feedback. In the table below, you can find the schedule for presentations (P) and feedback (F). A presentation of about 10 minutes should be prepared on the assignment. The feedback should consist of two slides: one with the strengths and one with the weaknesses of the report of the group on which feedback has to be given. The feedback group will receive the report of the group to be discussed on Friday.

Presentation/feedback schedule

	Assignment 1 Presentation Mon 14/5	Assignment 2 Presentation Tue 22/5	Assignment 3 Presentation Mon 21/5	Assignment 4 Presentation Tue 29/5	Assignment 5 Presentation Mon 11/6
Group 1	P			F (group 13)	
Group 2	P			F (group 14)	
Group 3	P			F (group 15)	
Group 4	P			F (group 16)	
Group 5		P			F (group 17)
Group 6		P			F (group 18)
Group 7		P			F (group 19)
Group 8		P			F (group 20)
Group 9	F (group 1)		P		
Group 10	F (group 2)		P		
Group 11	F (group 3)		P		
Group 12	F (group 4)		P		
Group 13		F (group 5)		P	
Group 14		F (group 6)		P	
Group 15		F (group 7)		P	
Group 16		F (group 8)		P	
Group 17			F (group 9)		P
Group 18			F (group 10)		P
Group 19			F (group 11)		P
Group 20			F (group 12)		P

In the table below you can find the names of the students for the different groups.

Group 1	Hu, T	Cock, A de	Biemans, A	Draijer, N	Somers, TPHY
Group 2	Siccama, JW	Meulenmeesters, AJM	Baak, HMD van	Schepers, B	Holhos, AO
Group 3	Pothuis, EM	Roodenburg, BT	Yang, J	Spijkerman, A	Nakkala, N
Group 4	Demming, M	Dewansingh, P	Fielbal, AF	Sportel, H	
Group 5	Hogendoorn, T	Schouten, EJW	Haaren, EWM van	Hilgers, RJ	
Group 6	Kerckhoffs, JC	Scheermeijer, RA	Blijleven, TS	Maarschalkerweerd, HA van	
Group 7	Peppel, CE van de	Schotel, TRW	Juif, ERSE	Marks, MJA	
Group 8	Vermetten, M	Schoonlingen, LN	Meij, R de	Postma, H	
Group 9	Loman, AWR	Arts, A	Meulen, SB van der	Dijkstra, J	
Group 10	Brummans, SML	Knol, JH	Craenen, PHM	Askarkyzy, D	
Group 11	Blankers, DM	Boomen, LJA van den	Cizik, L	Groof, BMJ de	
Group 12	Geertjes, PR	Schröder, AJ	Belibel, AS	Hennepe, D te	
Group 13	Hantink, RL	Feijen, S	Freriks, SAM	Kockan, S	
Group 14	Hins, FM	Goeij, MG de	Hollander, W	Sonnemans, AA	
Group 15	Henken, EC	Keiper, KM	Wilms, PFC	Lahcene, S Ben	
Group 16	Keus, JM	Logtenberg, MJ	Hendriksen, N	Venkataraman, S	
Group 17	Slager, MP	Kramer, T	Silvertand, AJWB	Goedhart, B	
Group 18	Erven, G van	Willems, SL	Olde Bijvank, RH	Hoogland, OJ	
Group 19	Pels, DG	Strijbosch, VMG	Schwaederle, CA	Bouwman, LMS	
Group 20	Dings, EEL	Baijer, HM	Ooijen, LAJ van	Hategan, IS	

Assessment strategy (toetsplan) PDQ-10804 Quality Systems Operations		Where assessed?					
Learning outcomes		Report on assignment 1	Report on assignment 2	Report on assignment 3	Report on assignment 4	Report on assignment 5	Written exam
1	relate the (dynamics of) food properties to quality attributes	x					x
2	know basic principles of operations management		x				x
3	recognise major management processes in operational quality systems in food organisations		x				x
4	use knowledge about major technological tools, methods, techniques in quality control and inspection			x			x
5	understand principles and recognise restrictions of different quality assurance standards				x		x
6	understand the major approaches to traceability of food products in complex food production chains					x	x
Contribution to final mark (%)		4	4	4	4	4	80
Reports on assignments		Assessors: Kasper Hettinga, Remco Germs, and Jack van der Vorst					
Written exam		Assessors: Kasper Hettinga and Jack van der Vorst					
<i>The exam consists of open questions and has to be passed (i.e. a score of at least 5.50)</i>							
<i>An example of the written exam will be provided on eduweb</i>							