جامعة نزوى
University of Nizwa

مركز دارس للبحث العلمي والتطوير التقني
DARIS Center for Scientific Research and Technology Development

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FOOD MYCOLOGY SHORT COURSE

5 day course

FOOD MYCOLOGY 5-Day COURSE

A Look at Theory and Practical aspects of Food spoilage and its management

Date: 22nd – 26th February, 2015

Lecturers:

Prof. Naresh Magan DSc. (Cranfield University, Bedfordshire, UK)

Dr. Angel Medina (Cranfield University, Bedfordshire, UK)

Dr. Ali Elyassi. Senior Application Chemist, Head of the Mass Spectrometry Unit (DARIS Centre at the University of Nizwa),

Operation of Muffle Furnace for sample preparation

Introduction

Prevention of food spoilage moulds and mycotoxin contamination are important in ensuring food security and conserving quality of food products. Many intermediate moisture food products have water contents (water activities) which can allow spoilage moulds (yeasts and filamentous fungi) to spoil products. Thus preservation systems, formulation of products and packaging systems are critical in ensuring that the shelf life of products can be maintained under either in ambient or cooled storage conditions.

There is thus a need for an understanding of the types of fungal species which can cause spoilage of products, their ecology, ability to produce mycotoxins and identify systems which can be utilised to minimise or prevent spoilage from occurring.

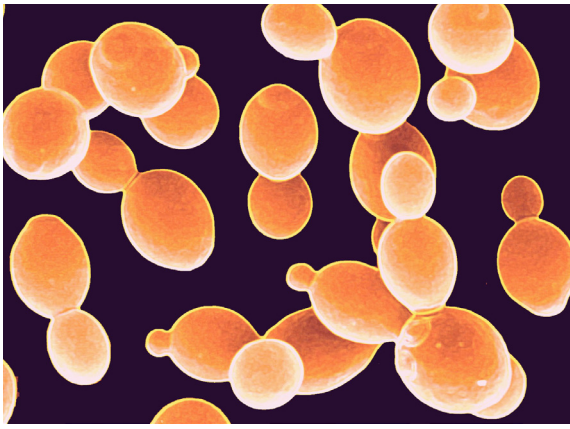
This course will provide both lectures and hands on practical training to identify and understand the ecology and control strategies for food spoilage moulds in food products.

The Course will include a full lecture programme in the mornings and practical training and hands on experience every afternoon.

Key learning objectives

To provide a thorough understanding of the ecology and physiology of yeasts and moulds in key food chains and the methods for detecting and controlling contamination, mycotoxin contamination, and use of hurdle technology for improving shelf life.

UHPLC analysis for high sample throughput
interfaced with Tandem Quadrupole



OBJECTIVES/LEARNING OUTCOMES/COMPETENCES

On successful completion of this course the participant should be able to:

1. Demonstrate a detailed knowledge and recognition of the key groups of fungi resposible for spoilage fungi in key food chains.

2. Demonstrate a critical ability to integrate knowledge and thinking on mycology problems in the context of the entire food supply chain.

3. Demonstrate a conceptual awareness of fungal ecology and mycotoxin contamination and apply this to situations relating to food safety and quality.

4. Apply the approaches presented in the course to industrial situations.

The manual of Food Mycology as well as all necessary stationary will be provided to all course attendees as a pack at the registration.

At the end of the course a Certificate of Attendance will be given to all registered attendees. The certificate will be signed by the Departmental Director and countersigned by the lecturers.

SYLLABUS/RANGE

Fungal ecology: concepts; fungal contamination in different food chains (e.g., cereals, bakery, fresh produce, cured meats and beverages); Heat resistant moulds; mechanisms of survival and control; Ecology of mycotoxigenic moulds in food; Legislative drivers for mycotoxin control; Practicals/ Case studies

Topics to be covered include:

1. Introduction – food mycology do we know enough??
2. Beverage and yeast spoilage
3. Heath resistant fungal spores and problems in beverages
4. Mycotoxins: their importance in different food chains
5. Mycotoxins: regulations and sampling issues
6. Ecology of spoilage moulds and hurdle technology
7. Modified atmosphere packaging to control spoilage moulds
8. Modelling fungal growth
9. Spoilage and mycotoxins in cured meats
10. Climate change impacts on moulds/mycotoxins: do we know enough?
11. Analysis and rapid diagnostics – traditional vs modern approaches
12. Factory environment – mould problems

Who should attend the course

Postgraduate students, industry professionals and academics wishing to learn and/or expand on their knowledge in the field of applied food mycology.

Gas chromatographic unit using Flame Ionization detector

Waters Acquity UPLC system

Prerequisite

An interest in the field of food mycology.

Lecturers

Prof. Naresh Magan DSc. (Cranfield University, Bedfordshire, UK) 27+ years of experience working on spoilage moulds, mycotoxins and prevention strategies. Prof. Magan has published 250+ research papers and is an international authority on this subject. He is a member of the International Commission for Food Mycology.

Dr. Angel Medina (Cranfield University, Bedfordshire, UK) 10+ years experience in working on mycotoxins, analysis and prevention strategies. Dr Medina has published 50+ research papers on food spoilage, mycotoxins and analyses of toxic secondary metabolites.

Dr. Ali Elyassi. Senior Application Chemist, Head of the Mass Spectrometry Unit (DARIS Centre at the University of Nizwa), Nizwa, Sultanate of Oman, 20 years' experience in analytical chemistry working in Pharmaceutical industry and Mass Spectrometry company.

Work load (Hours)

Lectures	13
Practical work	17

Date

Sunday 22nd of February to Thursday 26th of February 2015

Venue

Lecture theatre:	DARIS Centre / Building 26, University of Nizwa
Microbilogy Laboratory:	DARIS Centre / Building 26, University of Nizwa

Fee

500 O.R. per person

Waters Quattro Premier XE Tandem Quadrupole LC/MS/MS

Day	Sunday	Monday
Date	**22nd February**	**23rd February**
09:15-10.00	Module introduction background to module and Introduction to the importance of Fungi	Mycotoxins
	Coffee/refreshments	*Coffee/refreshments*
10.15- 11.00	Beverages : yeast spoilage	Mycotoxins: Regulations and sampling issues
11.00 -12.00	Heat resistance spores	Ecology and hurdle technology
1.00-2.00	Lunch	Lunch
2.00-3.00	***Group Practical session*** **(groups of 4-5)** **Serial dilution/ Plating techniques**	***Practical*** **Measurement of fungi in lab**
	Coffee/tea	Coffee/tea
3.00-5.00	***Practical*** **Enumeration of fungi from samples in lab and inoculation experiments**	***Practical*** **Examination and demonstrations** **of different spoilage moulds**

	Tuesday	Wednesday	Thursday
	24th February	**25th February**	**26th February**
	Modified atmosphere packaging	Diagnostics: traditional vs modern technologies for mycotoxin analyses	***Practical*** **Plating techniques, Measurement of a_w, shelf-life details of some food products in groups**
	Coffee/refreshments	*Coffee/refreshments*	*Coffee/refreshments*
	Moulds in cured meats: problems?	Modelling Fungal Growth data: related to practical work	***Practical*** **Analysis using HPLC/UV**
	Climate change impacts on food security and spoilage moulds /mycotoxins: do we know enough?	Indoor and factory environment: Spoilage moulds in damp environments	***Practical*** **Analysis using HPLC/UV**
	Lunch	Lunch	Lunch
	Practical **/Measurement of fungi in the lab** **Examination of different spoilage fungi**	***Practical*** **Mycotoxin extraction from sample**	***Practical*** **Measurement of cultures, Final growth calculations**
	Coffee/tea	Coffee/Tea	Coffee/Tea
	Practical **Examination of different spoilage moulds**	***Practical*** **Serial dilution plate/Growth rate calculations**	***Practical*** **Wrap up session and final conclusions of the course: theoretical and practical considerations**

Atomic Absorption Spectroscopy for the analysis of Metal ions

Waters Alliance HPLC unit with UV detector

For more details:

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