Training course on

The Analysis of Food and Feed Samples for the Presence of Genetically Modified Organisms

Organised by the European Commission
Joint Research Centre
in the context of the DG SANCO
Better Training for Safer Food (BTSF) initiative
in collaboration with

TUBITAK Marmara Research Centre, Food Institute,
Gebze Kocaeli, Turkey

12-16 April, 2010

WORK PROGRAMME

COURSE CONTENT

Covered topics:

- Overview of the EU legislation on GMOs and specific requirements
- Introduction to the general procedures for GMO detection
- Experimental planning and sample preparation
- DNA extraction
- Qualitative PCR for GMO analysis
- Real-time PCR for GMO quantification
- Sampling concepts and recommended EU protocol
- Laboratory implementation and conduction of a GMO detection laboratory
- Implementation of ISO 17025 for accreditation in a GMO testing laboratory
- Method validation criteria

Experimental work:

- Sample preparation and DNA extraction
- Qualitative PCR
- GMO quantitative analysis by real-time PCR
- Data analysis, expression and interpretation of the results

The course will provide overall scientific and technical information on sampling and on the analytical approaches for GMO analysis as well as hands on experience on how the methods are performed in the laboratory. In addition, the course will provide information on the different theoretical and technical requirements for proper laboratory implementation and conduction of testing activity according to current legislative requirements.

WORK PROGRAMME

1ST DAY – MONDAY, APRIL 12TH 2010

9:00 am Welcoming speech – opening of the course

9:30 am Introduction and course content, presentation of the organizers and of the participants – **M. Querci - JRC**

PREPARATION OF SAMPLES: DNA EXTRACTION

10:10 am **Experimental**: DNA extraction following the CTAB method - Part 1

10:40 am Coffee break

11:00 am **Experimental:** Preparation of agarose gels
DNA extraction following the CTAB method - Part 2

1:00 pm Lunch

2:00 pm **Experimental:** DNA extraction following the CTAB method - Part 3

3:00 pm **Experimental:** Sample loading

3:45 pm Coffee break

4:00 pm **Theory:** Sample preparation and DNA extraction

5:00 pm **Experimental:** Interpretation of the gels

5:20 pm End of the day

2ND DAY – TUESDAY, APRIL 13TH 2010

QUALITATIVE PCR

9:00 am **Theory:** Overview of GMO testing methodology

10:00 am **Experimental:** Qualitative PCR
Plant specific: detection of the **zein** and **lectin** genes

10:45 am Coffee break

11:00 am Preparation of agarose gels

11:20 am **Theory:** The polymerase chain reaction (PCR) and its application in GMO analysis

12:20 pm Lunch

1:30 pm Sample loading

2:00 pm **Theory:** GMO testing laboratory implementation, quality system and quality assurance

3:00 pm Interpretation of the gels (*zein* and *lectin* specific PCR)

3:15 pm Coffee break

3:45 pm **Experimental:** Screening PCR: detection of the **35S promoter**

4:45 pm End of the day

3RD DAY – WEDNESDAY, APRIL 14TH 2010

QUALITATIVE PCR

9:00 am **Experimental:** Nested PCR for the specific detection of Roundup Ready® soybean (1st PCR reaction) and maize MON810 events.

10:00 am Preparation of agarose gels

10:30 am Coffee break

11:00 am **Theory:** Serological and novel methodological approaches for the detection of GMOs

12:00 pm Sample loading (35S screening PCR)

12:30 pm Lunch

1:30 pm **Experimental**: Nested PCR for the specific detection of Roundup Ready® soybean (2nd PCR reaction) and maize MON810 events.

2:30 pm **Experimental**: Preparation of agarose gels and interpretation of the 35S screening PCR

3:00 pm Coffee break

3:30 pm **Theory:** Real-time PCR and its application in GMO analysis: detection and quantification

4:45 pm **Experimental:** Sample loading (nested PCR products)

5:15 pm End of the day

4TH DAY – THURSDAY, APRIL 15TH 2010

QUANTITATIVE REAL-TIME PCR

9:00 am **Experimental:** Interpretation of the gel Roundup Ready soybean and MON810 maize specific nested PCRs

9:15 am **Experimental:** Preparation of samples for the Real-Time PCR (Roundup Ready soybean method) and samples loading

10:30 am Coffee break

11:00 am **Theory:** Real-time PCR and its application in GMO analysis – Part 2

12:15 pm Lunch

1:15 pm **Experimental:** Experimental design, data analysis and interpretation

2:45 pm **Theory:** EU legislation on GMOs and mandate of the European Commission Joint Research Centre (JRC)

3:45 pm Coffee break

4:00 pm **Theory:** Sampling: basic principles

5:00 pm End of the day

5TH DAY – FRIDAY, APRIL 16TH 2010

QUANTITATIVE REAL-TIME PCR

9:00 am **Experimental:** Preparation of samples for the Real-Time PCR (TC1507 maize method) and samples loading

10:00 am Coffee break

10:30 am **Theory:** Method validation/verification and introduction to measurement uncertainty

12:00 pm Lunch

1:30 pm **Experimental:** Data analysis, result interpretation and reporting

2:30 pm ***Round table*:** Troubleshooting, data interpretation and practical experimental issues; questions and answers session.
General discussion and conclusion of the course

4:00 pm Transport to the hotel or airport