

TRAINING COURSE ON

THE ANALYSIS OF FOOD AND FEED SAMPLES FOR THE PRESENCE OF GENETICALLY MODIFIED ORGANISMS

26 - 30 October, 2009

*Centro de Ingeniería Genética y
Biotecnología (CIGB)
La Habana, Cuba*



COURSE CONTENT

Covered topics:

- ❑ Overview of EU legislation on GMOs and specific requirements
- ❑ Introduction on 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.

WORKPROGRAMME

1ST DAY – MONDAY, OCTOBER 26TH 2009

- 9:00 am Welcoming speech – opening of the course – **C. Borroto - CIGB**
- 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, OCTOBER 27TH 2009

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, OCTOBER 28TH 2009

QUALITATIVE PCR

- 9:00 am **Experimental:** Nested PCR for the specific detection of Roundup Ready® soybean (1st PCR reaction)
- 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)
- 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, OCTOBER 29TH 2009

QUANTITATIVE REAL-TIME PCR

- 9:00 am **Experimental:** Interpretation of the gel Roundup Ready soybean specific nested PCR
- 9:15 am **Experimental:** Preparation of samples for the Real-Time PCR 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, OCTOBER 30TH 2009

QUANTITATIVE REAL-TIME PCR

- 9:00 am **Experimental:** Preparation of samples for the Real-Time PCR 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