

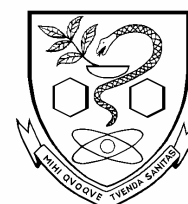


FAO/OIRSA/PAHO/ BASIC COURSE AWARENESS ON MICROBIOLOGICAL RISK ASSESSMENT

2006, OCTOBER 03 - 06
SAO PAULO, BRAZIL

FINAL REPORT

Universidade de São Paulo
Faculdade de Ciências Farmacêuticas



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1. Introduction

The FAO/PAHO/OIRSA BASIC COURSE "AWARENESS ON MICROBIOLOGICAL RISK ASSESSMENT" was held on 2006 October 03-06, in the Paulo Ferreira de Carvalho Auditorium, Faculty of Pharmaceutical Sciences, University of Sao Paulo, located at Avenida Professor Lineu Prestes 580, Bloco 13A, Cidade Universitária, 05508-900 Sao Paulo, SP, Brazil.

The course was implemented jointly by FAO/PAHO/OIRSA with the collaboration of the Brazilian Society of Microbiology and was oriented to Latin-American policy makers and food safety risk managers from governmental and non-governmental organizations, including members of national Codex committees, and to Latin-American scientists.

2. Objectives of the course

The main objective was to raise awareness of the principles and procedures for microbiological risk assessment in the context of risk management. Specific objectives were to explain the concept of microbiological risk assessment, explain the type of data, other resources and set-up required for microbiological risk assessment and factors influencing these and describe the work of the organizations involved in risk assessment at national or international level, their outputs and relevant resources material.

3. Participants

The course was attended by 41 participants, from 19 Latin American countries, plus trainers from Food and Agriculture Organization of the United Nations (FAO), Organismo Internacional Regional de Sanidad Agropecuária (OIRSA), Pan-American Health Organization (PAHO), University of Sao Paulo (USP), and two special lecturers: Dr. Aamir Fazil, from Public Health Agency of Canada, and Dr. Susana Jimenez, from Instituto de Tecnologia de Alimentos, Argentina.

The participants were sponsored by different institutions:

1. twelve invited and sponsored by FAO:
 - a. one trainer from FAO (Dr. Maria de Lourdes Costarrica)
 - b. one trainer from Argentina (Dr. Susana Jimenez)
 - c. two persons from Chile
 - d. two persons from Ecuador
 - e. two persons from Peru
 - f. two persons from Venezuela
 - g. one person from Brazil
 - h. one person from Colombia
2. eleven indicated and sponsored by Organismo Internacional Regional de Sanidad Agropecuária (OIRSA):
 - a. one trainer from El Salvador (Dr. Oscar Garcia Suárez)
 - b. two persons from Panama
 - c. one person from Cuba
 - d. one person from El Salvador
 - e. one person from Mexico
 - f. one person from Belize
 - g. one person from Guatemala
 - h. one person from Honduras
 - i. one person from Nicaragua
 - j. one person from Dominican Republic
3. eleven indicated and sponsored by the Pan-American Health Organization (PAHO):
 - a. one trainer from Canada (Dr. Aamir Fazil)
 - b. one trainer from Brazil (Dr. Kate Thomas)
 - c. two persons from Bolivia
 - d. two persons from Paraguay
 - e. two persons from Uruguay
 - f. one person from Brazil
 - g. one person from Cuba
4. seven indicated and sponsored by the Brazilian Society of Microbiology:
 - a. two persons from the Ministry of Agriculture
 - b. four trainers from the University of São Paulo
 1. Dr. Bernadette D.G.M. Franco
 2. Dr. Mariza Landgraf

3. Dr. Maria Teresa Destro

4. Dr. Irma Rivera

The Table summarizes the number of participants according to their countries:

	Country	Number of participants
1	Argentina	1
2	Belize	1
3	Bolivia	2
4	Brazil	9
5	Canada (trainer)	1
6	Chile	2
7	Colombia	1
8	Cuba	2
9	Dominican Republic	1
10	Ecuador	2
11	El Salvador	2
12	Guatemala	1
13	Honduras	1
14	FAO	1
15	Mexico	1
16	Nicaragua	1
17	Panama	2
18	Paraguay	2
19	Peru	2
20	Uruguay	2
21	Venezuela	2
	Total	41

The addresses of participants and trainers can be seen in **Annex 1** and **Annex 2**, respectively.

4. Program

The final program of the course and the names of the speakers can be seen in **Annex 3**.

In addition to the basic course available in the CD-ROM provided by FAO, three extra talks were presented:

- a. Risk Assessment of *Vibrio* in marine environment: a Brazilian study
- *Irma Rivera - USP - Brazil*
- b. Risk Assessment of *Vibrio* in oysters: a Brazilian study - *Mariza Landgraf – USP – Brazil*
- c. Use of epidemiologic data in Microbiological Risk Assessment -
Kate Thomas – PAHO – Brazil/Canada

5. Teaching resources

Each participant received a canvas bag containing one copy of the CD-ROM prepared by FAO/ICD/WHO in Spanish, a printed version of all material available in the CD-ROM, a copy of the "Simplified Guide to Understanding and Using Food Safety Objectives and Performance Objectives", prepared by the International Commission on Microbiological Specifications for Foods (ICMSF) and translated into Portuguese and Spanish, a brochure of the Brazilian Society of Microbiology and a highlighter pen.

6. Expectative for the course

In the first day of the course, the participants were requested to inform what were their expectative for the course. The answers can be summarized as follows:

- a. Professional development;
- b. Learn the basic concepts and their use and application;
- c. Improve expertise in the subject;
- d. Share experience ;
- e. Harmonize concepts;
- f. Learn how to improve government awareness on microbiological risk management;
- g. Learn how to improve consumers awareness on microbiological risks in foods;
- h. Learn how to integrate interested parties (food producers, policy makers, surveillance and other governmental authorities, scientist, etc);

- i. Learn how to integrate epidemiology data and laboratory testing;
- j. Build a Latin American network on microbiological risk assessment and food safety management;
- k. Understand the relationships between MRA and HACCP;
- l. In the far end, strengthen participation of Latin American countries in Codex activities (expert consultations, meetings, etc)

7. Development of the course

The course included lectures of different experts and working groups which facilitated the implementation/discussion of case studies and experiences from participants.

7.1. Multiple choice evaluation questionnaires

At the beginning of the course 31 participants filled in a Multiple Choice Evaluation sheet with 25 questions about their knowledge on basic concepts in Microbiological Risk Assessment.

The index of correct answers for the questions was as follows:

Question #	Index of correct answers
1	24/31 (77.5%)
2	12/31 (38.7%)
3	22/31 (70.9%)
4	16/31 (51.6%)
5	8/31 (25.8%)
6	23/31 (74.2%)
7	23/31 (74.2%)
8	25/31 (80.6%)
9	13/31 (41.9%)
10	15/31 (48.4%)
11	25/31 (80.6%)
12	14/31 (45.2%)
13	15/31 (48.4%)
14	14/31 (45.2%)
15	10/31 (32.3%)
16	22/31 (71.0%)

17	29/31 (93.6%)
18	23/31 (74.2%)
19	7/31 (22.6%)
20	6/31 (19.4%)
21	15/31 (48.4%)
22	11/31 (35.5%)
23	23/31 (74.2%)
24	27/31 (87.1%)
25	28/31 (93.6%)

7.2. Working Groups

For the exercises, the participants were split in three working groups, according to country of origin and expertise (government, industry or academia).

7.3 Lectures / Lecturers

See Program in **Annex 3**.

8. Evaluation of the course

8.1 Part I - Comments on the specific topics

Topic 1: Risk Analysis in Public Health and International Trade of Food. Introducing the Risk Analysis concept - *María de Lourdes Costarrica – FAO*

	Very good	Good	Average	Poor
Content	23	4	1	0
Clarity of speaker	23	6	0	0
Clarity of material	18	11	0	0
	Too long		Appropriate	Too short
Length	0		29	0

Topic 2: Microbiological Risk Management: principles, process and preliminary activities - *Bernadette Franco – USP - Brazil*

	Very good	Good	Average	Poor
Content	18	12	0	0
Clarity of speaker	13	12	5	0
Clarity of material	15	12	5	0
	Too long		Appropriate	Too short
Length	0		27	1

Exercise 1 – Description of the local situation - *Maria de Lourdes Costarrica – FAO and Maria Teresa Destro – USP - Brazil*

	Very good	Good	Average	Poor
Content	15	15	0	0
Clarity of material	12	16	2	0
	Too long		Appropriate	Too short
Length	1		27	2

Topic 3 – Lecture 1. Microbiological Risk Assessment: principles and concepts - *Aamir Fazil – PHAC – Canada*

	Very good	Good	Average	Poor
Content	20	10	0	0
Clarity of speaker	22	7	1	0
Clarity of material	15	11	3	0
	Too long		Appropriate	Too short
Length	1		26	2

Topic 3 – Lecture 2. Microbiological Risk Assessment: methodology - *Aamir Fazil – PHAC – Canada*

	Very good	Good	Average	Poor
Content	22	8	0	0
Clarity of speaker	21	9	1	0
Clarity of material	15	11	6	0
	Too long		Appropriate	Too short
Length	3		24	3

Exercise 2: Risk Assessment of *Staphylococcus aureus* in fermented sausages - *Susana Jimenez – ITA- UNL - Argentina*

	Very good	Good	Average	Poor
Content	14	11	4	0
Clarity of material	9	12	7	1
	Too long		Appropriate	Too short
Length	8		17	5

Topic 4 – The Joint FAO/WHO Expert Meetings on Microbiological Risk Assessment: introducing JEMRA - *Maria de Lourdes Costarrica – FAO*

	Very good	Good	Average	Poor
Content	20	9	2	0
Clarity of speaker	20	10	0	0
Clarity of material	16	13	0	0
	Too long		Appropriate	Too short
Length	0		24	2

Topic 5: Using the outcomes of MRA in Microbiological Risk Management - *Bernadette Franco – USP – Brazil*

	Very good	Good	Average	Poor
Content	20	7	0	0
Clarity of speaker	12	14	2	0
Clarity of material	10	17	1	0
	Too long		Appropriate	Too short
Length	0		23	3

Topic 6: Implementation of FSO and related measures in microbiological risk management - *Bernadette Franco – USP – Brazil*

	Very good	Good	Average	Poor
Content	20	9	0	0
Clarity of speaker	15	13	2	0
Clarity of material	14	15	1	0
	Too long		Appropriate	Too short
Length	0		21	7

Topic 7: MRA and HACCP: similarities and differences - *Oscar Jesus Garcia Suárez – OIRSA*

	Very good	Good	Average	Poor
Content	21	10	0	0
Clarity of speaker	16	14	1	0
Clarity of material	13	16	1	0
	Too long		Appropriate	Too short
Length	0		28	2

Topic 8: MRA in practice: infrastructure and basic requirements - *Maria de Lourdes Costarrica – FAO*

	Very good	Good	Average	Poor
Content	25	4	1	0
Clarity of speaker	14	12	1	0
Clarity of material	18	12	0	0
	Too long		Appropriate	Too short
Length	0		27	2

Topic 9: Microbiological Risk Assessment in practice: getting started - *Maria de Lourdes Costarrica – FAO*

	Very good	Good	Average	Poor
Content	25	4	0	0
Clarity of speaker	25	4	0	0
Clarity of material	18	11	0	0
	Too long		Appropriate	Too short
Length	0		27	2

Exercise 3: Risk Analysis applied to risk management of *Salmonella* Enteritidis in eggs - *Maria de Lourdes Costarrica – FAO* and *Maria Teresa Destro - USP - Brazil*

	Very good	Good	Average	Poor
Content	18	9	0	0
Clarity of material	14	13	0	0
	Too long		Appropriate	Too short
Length	3		12	12

8.2 Part II – General Comments

	Very Good	Good	Average	Poor
1. Has the objective of the course been achieved?	14	16	0	0
2. What is your overall appraisal of the duration of the course?	7	23	0	0
3. What is your overall appraisal of the quality of the training material?	16	14	0	0
4. What is your overall appraisal of the organization of the course?	28	2	0	0
5. What is your overall appraisal of the course in general?	1. Interesting and well organized. 2. Very good training material. 3. The duration of course was too short. Time for exercises was not enough.			

	<ol style="list-style-type: none"> 4. Lecturers were excellent. 5. Valuable information. 6. Very productive. 7. Very important for developing countries. 8. The number of exercises should be increased. 9. Simultaneous translation of the talks in English into Spanish was very helpful. 10. Talks in Portuguese should have been translated into Spanish.
<p>6. What do you recommend to improve the training material?</p>	<ol style="list-style-type: none"> 1. The training material is excellent; no improvement is needed. 2. The printed material should be printed in colors, and one slide per page. 3. The printed material should include the side notes. 4. Increase the number of exercises even if they are not discussed in the course. 5. The information on mathematical modeling should be improved. 6. The training material should be sent to the participants in advance. 7. Include demos of modeling softwares. 8. Include the bibliography when data are shown. 9. Include practical examples, from different countries.
<p>7. How could this course be improved in the future?</p>	<ol style="list-style-type: none"> 1. The course is excellent; no improvement is needed. 2. Spend more time in exercises and discussions. 3. Increase the number of exercises. 4. Send the training material in advance 5. The course should be taught in one part of the day only, so that the other part can be spent studying. 6. The course should last five days instead of four. 7. Inform previously that a lap-top is very helpful.
<p>8. What was the most useful aspect of this course?</p>	<ol style="list-style-type: none"> 1. All aspects were useful. 2. The expertise of the lecturers. 3. Working in groups and interacting with the lecturers. 4. Availability of printed material. 5. The combination between theory and practice. 6. The exercises. They are very good to consolidate the new concepts. 7. The interaction and friendship among participants from different countries and different levels of knowledge. 8. Lecture 7, which explains the difference between HACCP and MRA.

9. Personal action plan for each participant

The FAO/PAHO/OIRSA course was implemented on a pilot basis and demand from participants and active participation as well as a quick follow-up in order to facilitate the integration of the information received in the respective activities carried out by each participant in their respective country. Taking this in consideration each participant defined what they could do as follow-up of this course. It is expected that in six months time the organizers of the course contact participants again to assess what were the challenges or benefits the participants, faced/received after the course.

A summary of the personal activities proposed by each participants are attached as **annex 4**.

10. Suggestions from local coordinator and local lecturers on structure of the course

The local coordinator and the lecturers feel that the course can be more beneficial if taught only in the mornings, leaving the afternoon for reading and digesting the new information.

11. Suggestions on proposed changes in the material

- a. We recommend including in the "Guidance for Users" information that participants may like to have a printed copy of the selected presentations before the course starts, so they can follow the talks easily and make notes when necessary.
- b. We suggest including in the CD-ROM a file containing all presentations, in a ready-to-print format in black color (some slides in color, when printed in black, cannot be read).
- c. We suggest including other options of exercises, so that the coordinator can select those that are more appropriate for the audience or fit better in the time frame.

**Report prepared by: Prof. Bernadette D.G.M. Franco
Brazilian Society for Microbiology**



Annex 1

Participants of the MRA Course – Brazil 2006 October 03-06

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Annex 2

Trainers of the MRA Course – Brazil 2006 October 03-06

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Annex 3

PROGRAM MRA Course – Brazil 2006 October 03-06

October 03

09.00 – 09.30	Opening and welcome <i>Maria de Lourdes Costarrica – FAO</i>
09.30 – 10.30	Introduction of participants and lecturers Overview and objectives of the course <i>Bernadette Franco – USP - Brazil</i>
10.30 – 11.00	Coffee-break
11.00 – 12.00	Topic 1: Risk Analysis in Public Health and International Trade of Food. Introducing the Risk Analysis concept <i>Maria de Lourdes Costarrica – FAO</i>
12.00 – 13.30	Lunch
13.30 – 14.30	Topic 2: Microbiological Risk Management: principles, process and preliminary activities <i>Bernadette Franco – USP - Brazil</i>
14.30 – 16.00	Exercise 1 – Description of the local situation (four working groups) Coord: <i>Maria de Lourdes Costarrica – FAO and Maria Teresa Destro – USP - Brazil</i>
16.00 – 16.15	Coffee-break
16.15 – 17.15	Presentation of results of working groups (15 min/group) Coord: <i>Maria de Lourdes Costarrica – FAO and Maria Teresa Destro – USP - Brazil</i>

October 04

09.00 – 10.00	Topic 3 – Lecture 1. Microbiological Risk Assessment: principles and concepts <i>Aamir Fazil – PHAC - Canada</i>
10.00 – 10.30	Coffee-break
10.30 – 12.00	Topic 3 – Lecture 2. Microbiological Risk Assessment: methodology <i>Aamir Fazil – PHAC - Canada</i>
12.00 – 13.00	Lunch
13.00 – 14.00	Topic 3 – Lecture 2. Microbiological Risk Assessment: The FAO/WHO <i>Listeria monocytogenes</i> example <i>Aamir Fazil – PHAC - Canada</i>
14.00 – 14.30	Systematic review, Methanalysis and Risk Assessment <i>Aamir Fazil – PHAC - Canada</i>
14.30 – 15.30	Topic 4 – The Joint FAO/WHO Expert Meetings on

	Microbiological risk Assessment: introducing JEMRA <i>Maria de Lourdes Costarrica – FAO</i>
15.30 – 16.00	Coffee-break
16.00 – 17.00	Exercise 2: Risk Assessment of <i>Staphylococcus aureus</i> in fermented sausages – Introduction Coord: <i>Susana Jimenez – ITA- UNL - Argentina</i>

October 05

09.00 – 10.00	Exercise 2: Risk Assessment of <i>Staphylococcus aureus</i> in fermented sausages – Continuation Coord: <i>Susana Jimenez – ITA- UNL - Argentina</i>
10.00 – 10.30	Coffee-break
10.30 – 11.30	Presentation of results of working groups (20 min/group) Coord: <i>Susana Jimenez – ITA- UNL - Argentina</i>
11.30 – 12.00	Risk Assessment of <i>Vibrio</i> in marine environment: a Brazilian study <i>Irma Rivera - USP - Brazil</i>
12.00 – 12.30	Risk Assessment of <i>Vibrio</i> in oysters: a Brazilian study <i>Mariza Landgraf – USP - Brazil</i>
12.30 – 13.30	Lunch
13.30 – 14.30	Topic 5: Using the outcomes of MRA in Microbiological Risk Management <i>Bernadette Franco – USP - Brazil</i>
14.30 – 15.30	Topic 6: Implementation of FSO and related measures in microbiological risk management <i>Bernadette Franco – USP - Brazil</i>
15.30 – 16.00	Coffee break
16.00 – 17.00	Topic 7: MRA and HACCP: similarities and differences <i>Oscar Jesus Garcia Suárez – OIRSA</i>

October 06

09.00 – 10.00	Topic 8: MRA in practice: infrastructure and basic requirements <i>Maria de Lourdes Costarrica – FAO</i>
10.00 – 10.30	Coffee-break
10.30 – 11.30	Topic 9: Microbiological Risk Assessment in practice: getting started <i>Maria de Lourdes Costarrica – FAO</i>
11.30 – 12.00	Exercise 3: Plan for local application of risk analysis concepts <i>Maria de Lourdes Costarrica – FAO</i>
12.00 – 13.30	Lunch
13.30 – 15.00	Exercise 3: Risk Analysis applied to risk management of <i>Salmonella</i> Enteritidis in eggs Coord: <i>Maria de Lourdes Costarrica – FAO y Maria Teresa Destro - USP</i>
15.00 – 15.30	Coffee-break
15.30 – 16.30	Presentation of results of working groups (20 min/group) Coord: <i>Maria de Lourdes Costarrica – FAO y Maria Teresa Destro - USP</i>
16.30 – 16.45	Completion of evaluations, multiple choice
16.45 – 17.00	Evaluation and Closing



Annex 4

PERSONAL ACTION PLANS MRA Course – Brazil 2006 October 03-06

Participant	Country	Plan
Alcides Jáen	Panamá	<ul style="list-style-type: none"> • Read the teaching material and prepare a presentation with selected slides
Alejandro T. Baldivieso	Bolivia	<ul style="list-style-type: none"> • Reproduce the course to authorities in the Ministry of Health
Ana Reyes	Mexico	<ul style="list-style-type: none"> • Summarize the expectations and achievements in the course • Present the course to companies and government
Carola Z. Coria	Bolivia	<ul style="list-style-type: none"> • Reproduce the course to governmental authorities, the Bolivian Codex Committee, industries, universities, and institutions that may be interested in the subject • Train a group of people and start a MRA in fresh cheese
Esequiel Liuson	Brazil	<ul style="list-style-type: none"> • Study the MRA already done in other countries, and evaluate their influence on the export of Brazilian bovine meat
Estela Quinones	Paraguai	<ul style="list-style-type: none"> • Work with the Epidemiology Surveillance on order to improve the collection of data on foodborne diseases • Replicate the course to colleagues in the Department
Guillermo Figueroa	Chile	<ul style="list-style-type: none"> • Replicate the course to individuals working in governmental organizations related to control of foods. • Promote an e-course for foreign students

Ingrid Guevara	Colombia	<ul style="list-style-type: none"> • Reproduce the course to colleagues, governmental authorities and people that may participate in the MRA team • Increase awareness on the topic among professionals involved in public health and in international trade of foods
Javier Rodriguez	Ecuador	<ul style="list-style-type: none"> • Replicate the course in the country within 6 -12 months
Jimena Gesto Berti	Uruguay	<ul style="list-style-type: none"> • Reproduce the course to colleagues in my institution • Increase the awareness on MRA among government people • Set a multidisciplinary group to discuss the importance of MRA in the country
Jose Luiz Alvarez Rios	Guatemala	<ul style="list-style-type: none"> • Present a report on the course • Replicate the course • Improve the awareness • Implement MRA
José Valenzuela Ramirez	Dominican Republic	<ul style="list-style-type: none"> • Replicate the course to government, food industries, scientists and consumers • Coordinate a committee with people from the Ministries of Health and Agriculture, to evaluate the situation of MRA in the country
Kirla Torres	Honduras	<ul style="list-style-type: none"> • Reproduce the course to colleagues and other persons working in health and environmental organizations
Luis Mele Echeverria	Uruguay	<ul style="list-style-type: none"> • Improve my knowledge on MRA • Apply the knowledge in decision making
Magda Saltos Paredes	Ecuador	<ul style="list-style-type: none"> • October – December 2006: introduce MRA concepts in the country • January – March 2007: start new courses in MRA for people in governmental institutions related to food safety
Maria del Rosario Uria Toro	Peru	<ul style="list-style-type: none"> • Replicate the course to individuals working in food safety • Replicate the course to individuals of the Technical Committees related to Codex
Nathaly Girán	Venezuela	<ul style="list-style-type: none"> • Inform my superiors that there is a need to increase awareness on MRA and that food safety is farm-to-fork.

Nelly Ortiz	Paraguay	<ul style="list-style-type: none"> • Reproduce the course to colleagues in my institution • Stimulate the generation of data required for MRA
Pamella Telles	El Salvador	<ul style="list-style-type: none"> • Read again all teaching material and improve the experience on MRA • Replicate the course to government, industry and consumers
Paula Ramirez	Peru	<ul style="list-style-type: none"> • Replicate the course to individuals from Dirección de Higiene de Alimentos, where a MRA group was recently created • Insist on the need to collect data on foodborne diseases
Rachel Ferreira	Brasil	<ul style="list-style-type: none"> • Discuss with the Ministry of Agriculture the possibility of training colleagues, with the help of the University of Sao Paulo and the Brazilian Society of Microbiology.
Rejane Alves	Brasil	<ul style="list-style-type: none"> • Read again all the teaching material • Set a multidisciplinary group to discuss the FAO material • Implement surveillance on foodborne diseases in the country • Include in the Planning for 2007 of the Ministry of Health training courses for technicians in charge of monitoring foodborne diseases • Implement the training courses • Evaluate results after six months
Sergio E. H. López	Cuba	<ul style="list-style-type: none"> • Replicate the course at national level • Replicate the course in the provinces • Sensitize the government • Do a MRA
Sonia Garcia	Nicaragua	<ul style="list-style-type: none"> • Share the new knowledge with department colleagues • Give lectures to risk managers
Susana Binotti	Argentina	<ul style="list-style-type: none"> • Multiply and distribute the teaching material • Identify possible persons interested in doing a MRA of <i>E.coli</i> O157:H7 in minced meat • Promote a training course to professionals of SENASA
Telma Maria Rodriguez	Cuba	<ul style="list-style-type: none"> • Replicate the course in the country • Contribute to improve the work done in the country on MRA

Viviana Cachicas	Chile	<ul style="list-style-type: none"> • First month: write a report to the Public Health Institute and to the Ministry of Health • Months 1-2: replicate the course to health and agriculture authorities • Months 3-4: evaluate parameters and perspectives for a MRA of <i>Vibrio parahaemolyticus</i> in seafood from the North and South of Chile.
Zoraida Alexandra Zea	Venezuela	<ul style="list-style-type: none"> • First six months: Replicate the teaching material and the course to individuals from Universidad Central de Venezuela and Escola de Saúde Pública • Next six months: Replicate the teaching material and the course to individuals in Instituto Nacional de Higiene • Publish an article on MRA in Cuaderno de Salud Publica, focusing on mRA of <i>Staphylococcus aureus</i> in artisan white cheese in Venezuela