



# JIFSAN's Training programs and Approach to Monitoring Impact

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# Why is Training Needed?

## Reasons

- ❖ Demand for food has changed
  - “Seasonal foods” all year
  - Tropical fruits, sea food, beyond production capacity
- ❖ Increase dependence on imported foods
  - Food travels longer distances than ever
  - Production scattered around the world
- ❖ Food Safety Modernization Act
  - Changes to Food, Drug and Cosmetics Acts of 1938

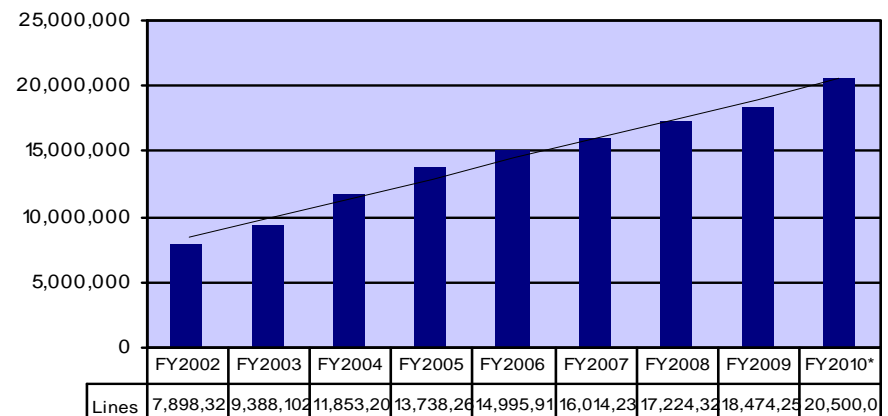
## Examples

- ❖ Apple juice:
  - 85% of the apple juice Americans drink is imported
  - But only about 7% of the apples

## Examples

- ❖ Seafood:
  - 86% of the shrimp, salmon, tilapia and other fish and shellfish comes from other countries
    - Shrimp: China, Bangladesh, S. Korea
  - Blue crab: Maryland-style crab cakes in the grocery's frozen food section...the crab meat mostly comes from Indonesia, Thailand or the Philippines.

### Imports of regulated products increased nearly threefold between 2002 and 2010 (Gill, 2011)



# Joint Institute for Food Safety and Applied Nutrition (JIFSAN)



## When?

- ❖ Established in 1996.

## How?

- ❖ A collaborative effort between the University of Maryland, the U.S. Food and Drug Administration (CFSA and CVM), and the private sector

## What?

- ❖ A multidisciplinary research, education and outreach program – domestic and international in scope

## Why?

- ❖ Difficult to conduct all the research needs to improve food safety, train people in risk analysis and rapidly changing lab methods for detection of food safety hazards in developed and developing countries, and for government to get data from industry

## Concepts of Operation

- ❖ Build programs through partnerships
- ❖ Leverage and share resources
- ❖ Create a neutral environment conducive to exchange of ideas and conducting research
- ❖ Develop international collaborations



# JIFSAN Training Portfolio

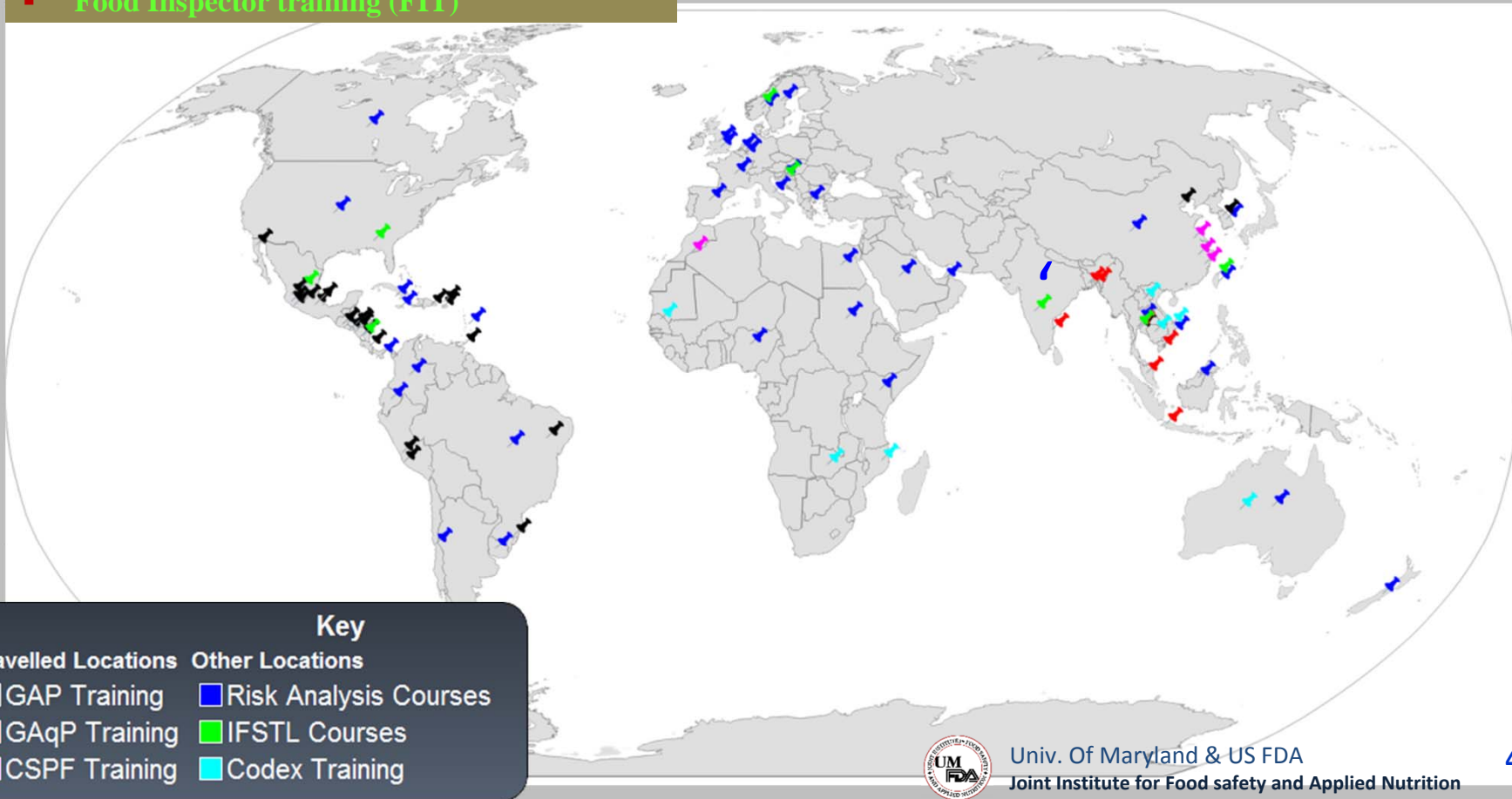


## International training programs

- Good Agricultural Practices (GAP)
- **Good Aquacultural Practices (GAqP)**
- Commercially Sterile Packaged Foods (CSPF)
- **Food Inspector training (FIT)**

## Food Safety Risk Analysis Training Program

## International Food Safety Training Laboratory



# Food Safety Laboratory Capacity Training



Hands-on training on standard methods for detecting chemical and microbial contaminants in food in a state-of-the-art facility being built with the support from

*Waters Corporation*  
Summer 2011



*Expert Training*

*State of the Art Facility*



# METRICS



Food Modernization Act charged FDA to develop a comprehensive plan to expand the technical, scientific and regulatory capacity of foreign governments, and their respective food industries, from which the foods are exported to the US

## **FDA asked Joint Institute for Food Safety and Applied Nutrition – Spring 2012**

To develop a pilot evaluation tools/instruments  
to measure effectiveness and impact of JIFSAN's  
international capacity building training programs

“The FDA Food Safety Modernization Act (FSMA), the most sweeping reform of our food safety laws in more than 70 years, was signed into law by President Obama on January 4, 2011. It aims to ensure the U.S. food supply is safe by shifting the focus from responding to contamination to preventing it”.

*from FDA.gov*

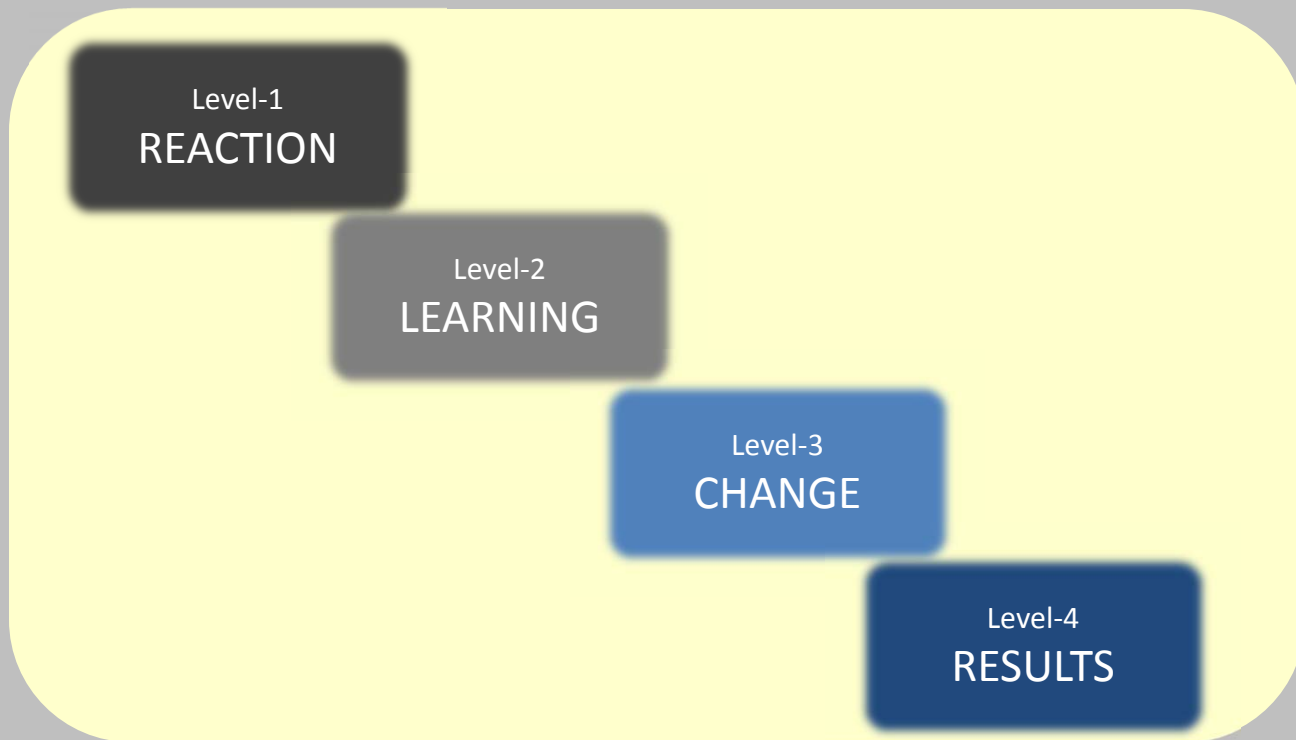




# Literature Review – Training Valuation General Models



## Kirkpatrick's 4 steps Model



Phillips

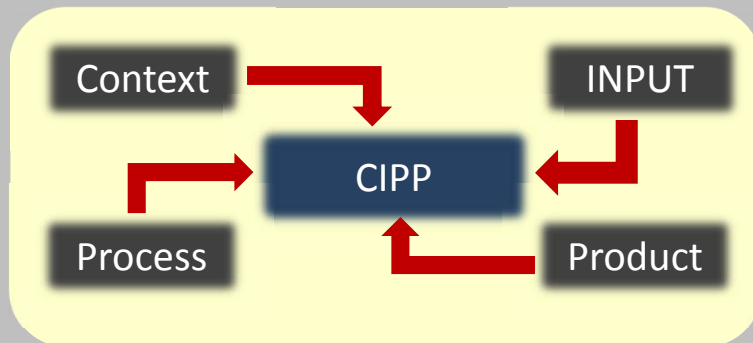


# Literature Review – Training Valuation

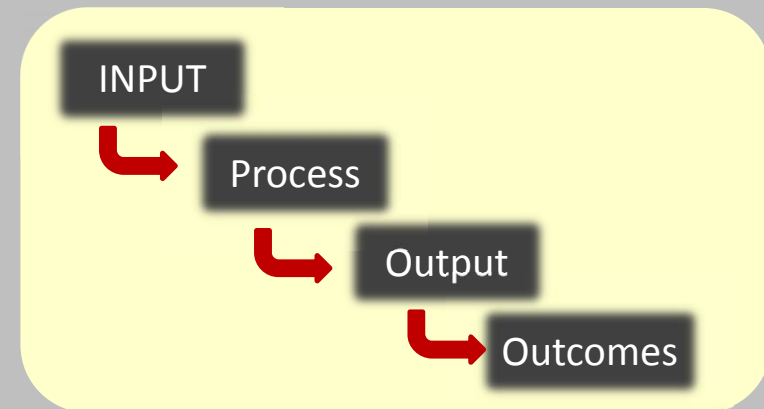
## General Models



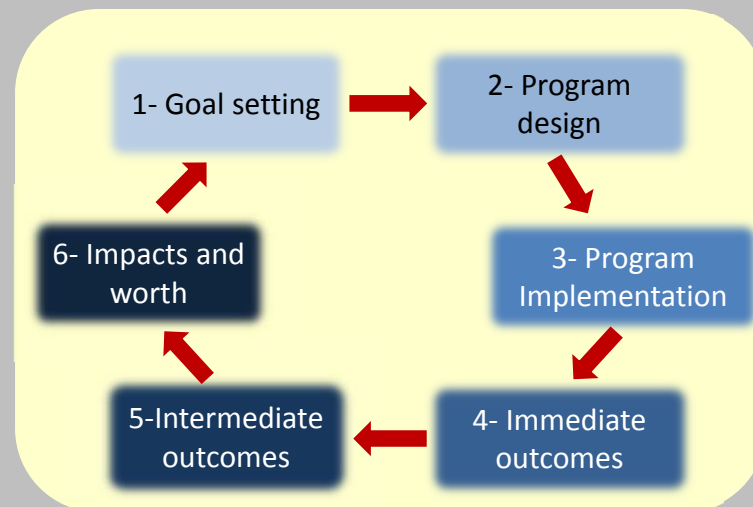
### CIPP Model



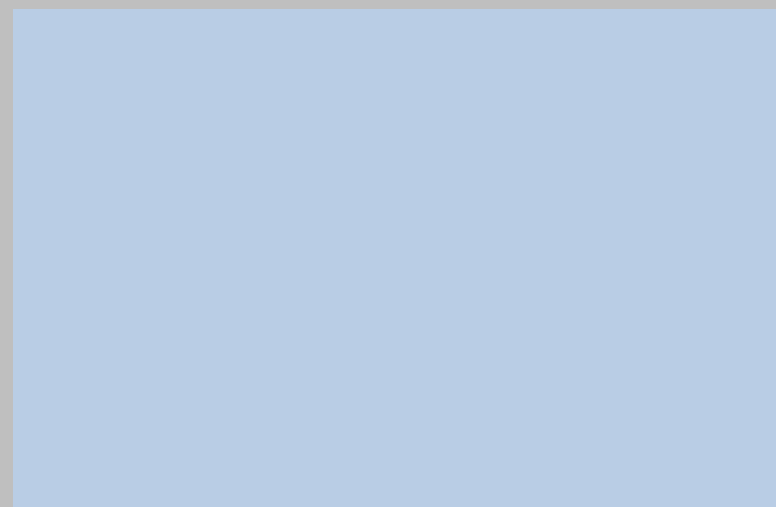
### Bushnell's Systems



### Brinkerhoff's six stages



### Other Models





# Literature Review – Training Valuation GAP and Food Supply (hand washing)



## Literature

- ❖ *Survey Papers:*
  - *A review of food safety and food hygiene training studies in the commercial sector (Egan, Raats, Grubb, Eves, Lumbers, Dean, & Adams, 2007)*
  - *Meta-Analysis of Food Safety Training on Hand Hygiene Knowledge and Attitudes among Food Handlers (Soon, Baines, & Seaman, 2012)*
- ❖ *Other relevant articles (...)*

## Main results

- ❖ *“The need for the development of evaluation criteria of effectiveness of food hygiene training”*
- ❖ *Most studies focus on handwashing and hygiene in restaurants*



# Literature Review

## Related training & Policy framework



### Capacity Building

- ❖ Evaluation of Capacity-Building Interventions – related sectors (Health)

### Policy Framework

- ❖ Incentives and barriers to the adoption of Good Agricultural Practices
- ❖ Impact of food safety regulations (HACCP, US SPS, EU) on exports (LDCs).
- ❖ Consumer



# Outcome of Literature Review



## Developed strategy

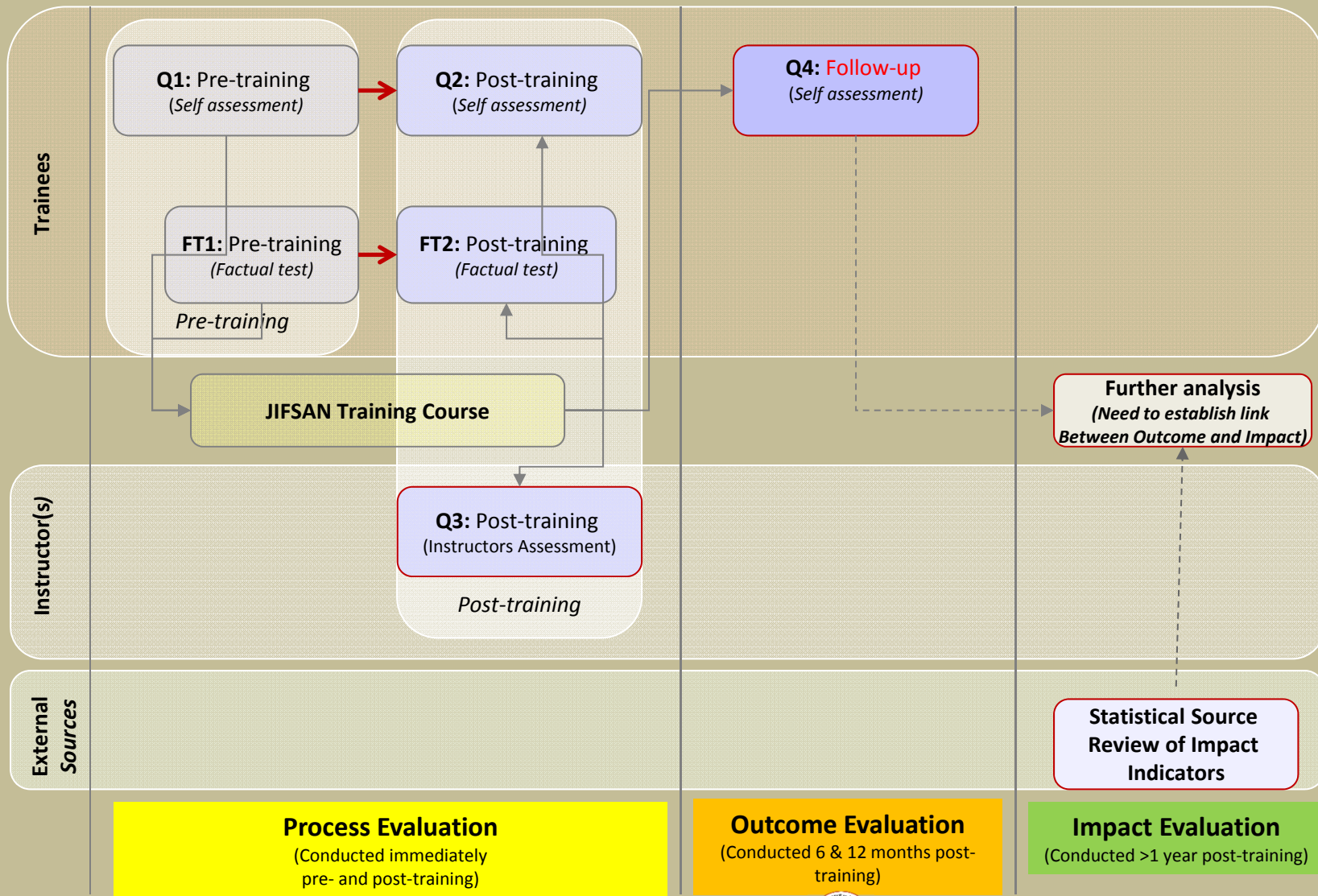
- ❖ Identify the necessary data
- ❖ Refocus the approach and refine tools (tests and questionnaires)
- ❖ Improve the communication and engage partners

## Review paper

- ❖ The general discussion on capacity building valuation
- ❖ Summary of studies on the valuation of Food Safety Capacity Building programs
- ❖ Identify gaps in the literature on the valuation of Food Safety Capacity Building programs



# METRICS: Approach to Evaluating the Effectiveness of JISFAN Training Courses



# Process Evaluations



- **Pre-training self assessment** – Provides the trainers insight into the group that is about to be trained, such as what they think their skill levels are, and helps the trainers identify the specific raining needs for that country/commodity/lab testing method;
- **Post-training self assessment** – Assesses the participant’s views and satisfaction with the different components of the training, including the instructors’ teaching abilities, and contains a self-assessment of one’s understanding and readiness to implement the different components covered during the training;
- **Factual test (pre and post)** – Provides a quantifiable measure on the knowledge gained during the training program;



# Process Evaluations



			Pre Questionnaire	Post Questionnaire
<b>General Information</b>	Demographics	Gender, Country, Age	X	
	Education	English-Proficiency, HIGHEST level of Education, Diplomas and certificates, and formal academic training	X	
	Professional experience	Sector (Federal, State, Private...), area, PRIMARY function, years in position & years in profession	X	
	Previous trainings	International (JIFSAN), REGIONAL or NATIONAL, online JIFSAN course	X	
<b>General satisfaction</b>	Personal goals achieved			X
	Recommending the training			X
<b>Detailed satisfaction</b>	Training	(Clarity, content, practice exercises, materials, relevancy, consistent with ads)		X
	Instructors	(Expertise, communication, teaching, responsiveness)		X
	Environment	(Room, length, food)		X
	Tests and assessments	Appropriate content, Helpful, Strength/Weakness, Too many/long, Not enough/short		X
<b>Learning - Factual tests and Self Ranking</b>	Self Ranking -prior to the training		X	X
	Self Ranking - After the training			X
	Satisfaction with the training:	List of topics (Aquaculture Production, Hatchery & Grow-Out, Seafood HACCP, Processing, Sanitation, & Traceability, US FDA Rules & Regulations, Food Safety & Prevention Programs)		X
	Ability in applying the new skills	List of topics, list of lab procedures		X
	<b>Factual test</b>		<b>X</b>	<b>X</b>
<b>Targeting and multipliers</b>	Involved in training activities		X	
	GAPs (.) trainings provided last year		X	
	Other trainings provided last year		X	
	Company export product to US		X	
	Company export product to US from own farm		X	
	Involvement in Inspection/regulation of Exports to US		X	



# Process Evaluations

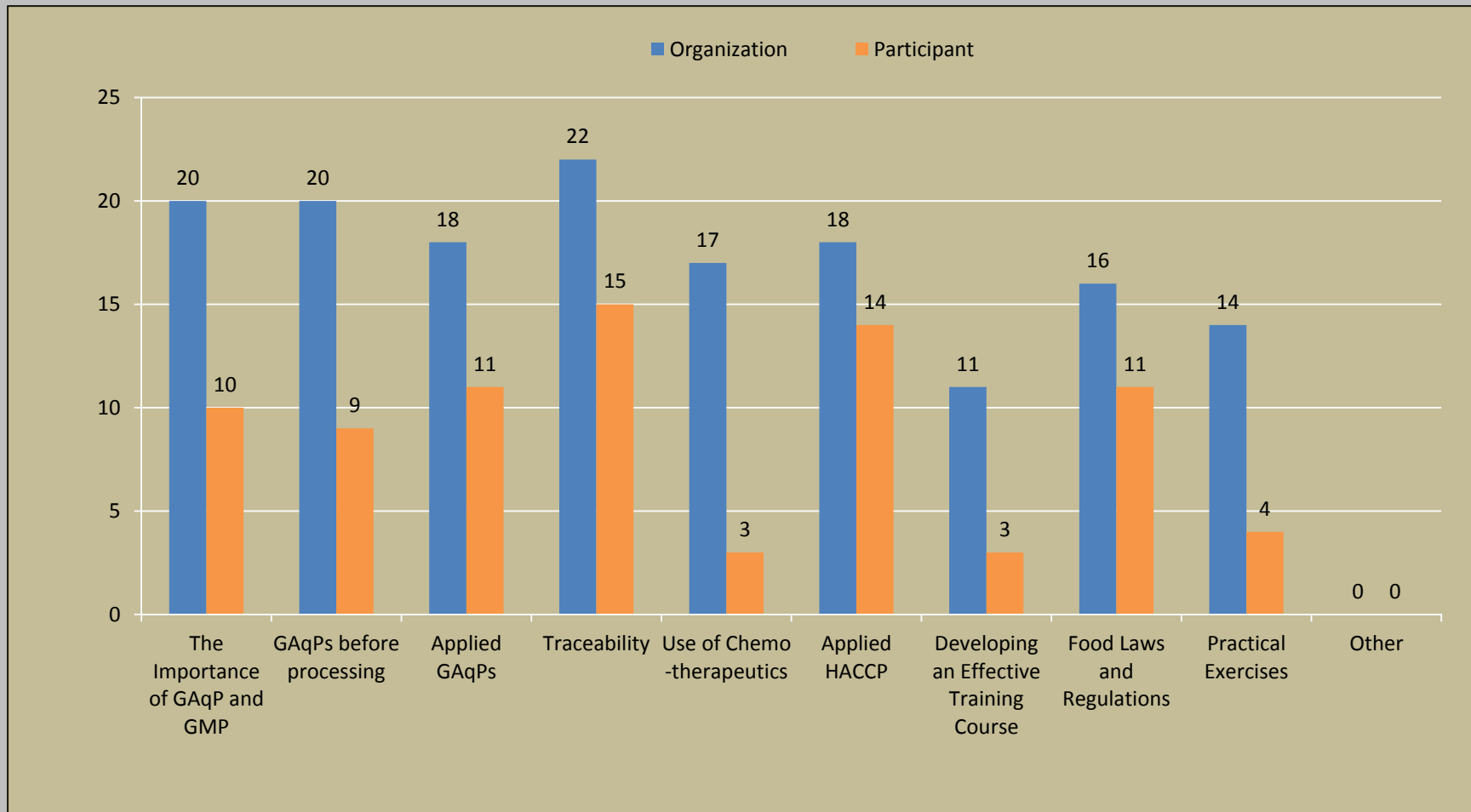


			Pre Questionnaire	Post Questionnaire
<b>Needs, expectations &amp; motivation</b>	Important training needs for participant	List of topics, list of lab procedures	X	
	Important training needs for participant's organization (post & pre)	List of topics, list of lab procedures	X	X
	Motivations	Involvement in training, Improved skills, Better job, New Opportunities, Advancement in career, Other	X	
	Primary source of funding		X	
	Payments		X	
<b>Barriers</b>	Potential reasons that will make it difficult for you to implement training	None, Infrastructure, Access, Equipment, Recognition, Other		X
	Potential reasons that made it difficult for you to achieve your goals from the training:	None, Limited Experience, Language issues, Material not relevant, Unprepared (advanced) course, Other		X
	Labor barriers	Understaffed / Overworked, Not trained in Applying HACCP, Not trained in Applying GAqP, No GAqP/Food Safety Plan, No Middlemen, Other, None	X	
	Institutional or organizational barriers	Lack of regulations, Lack of accreditation, Lack of awareness, Problems with traceability, Other, None	X	
	Equipment and/or infrastructure barriers	Testing/Lab equipment, Sanitation Equipmnet, Filtration systems, Ice production, Aquariums, Other, None	X	
	Country infrastructure barriers along the supply chain	Inadequate cold storage, Bottlenecks at shipment points, Utilities, Approved drugs, Other, None	X	
<b>Feedback &amp; evaluation</b>	Suggestions to improve the training (pre post), like the most, like the least		X	X
	Suggestions to improve the Questionnaire		X	





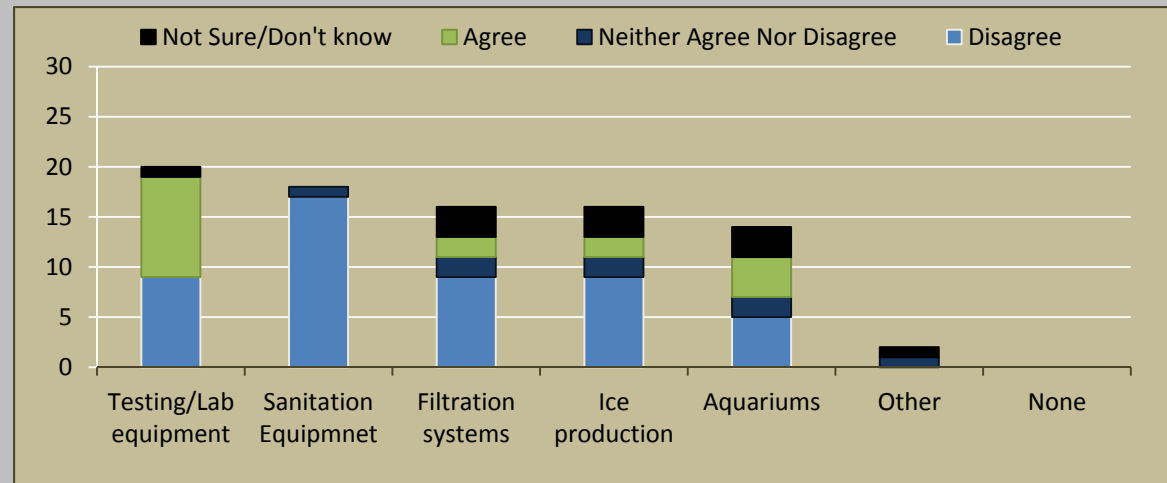
# Pre-training Assessments: Participants' and organization's training needs



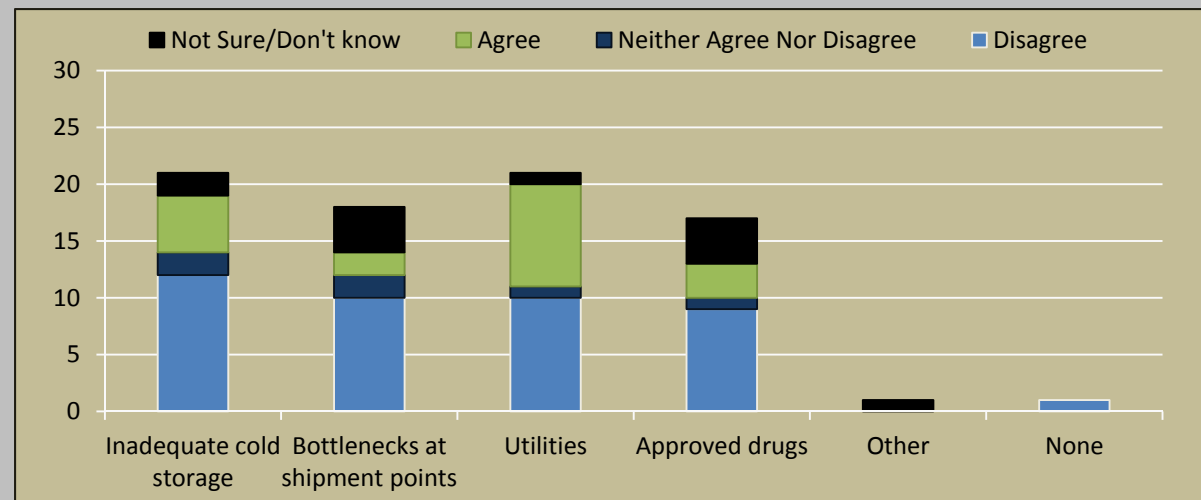
# Pre-training Assessments: Reported barriers to food safety



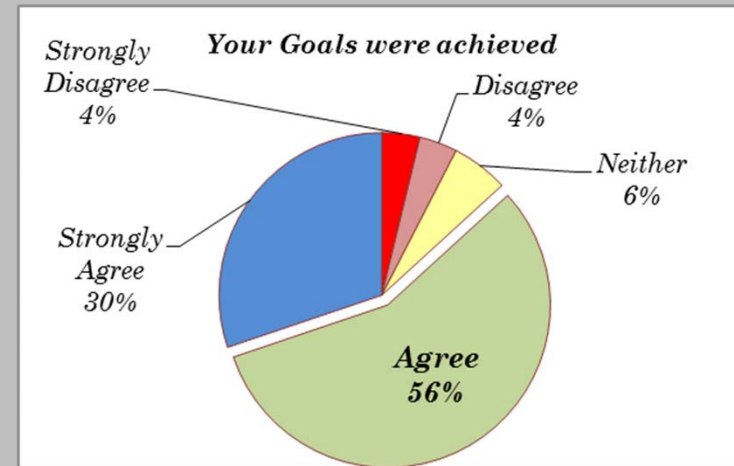
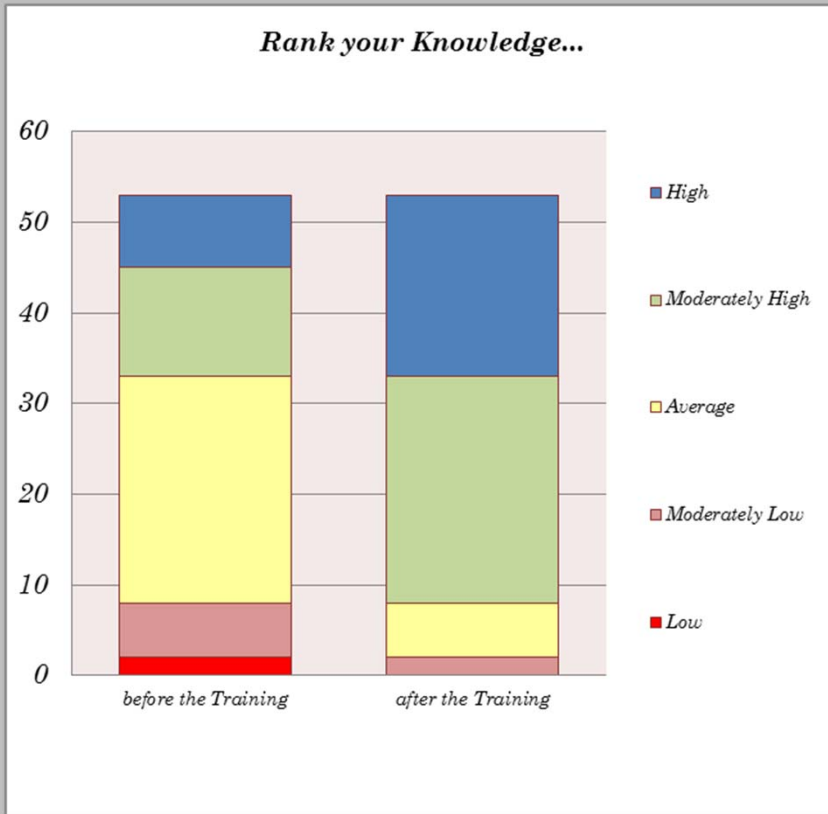
**Pre-training: Participants reported barriers: Company equipment and laboratory**



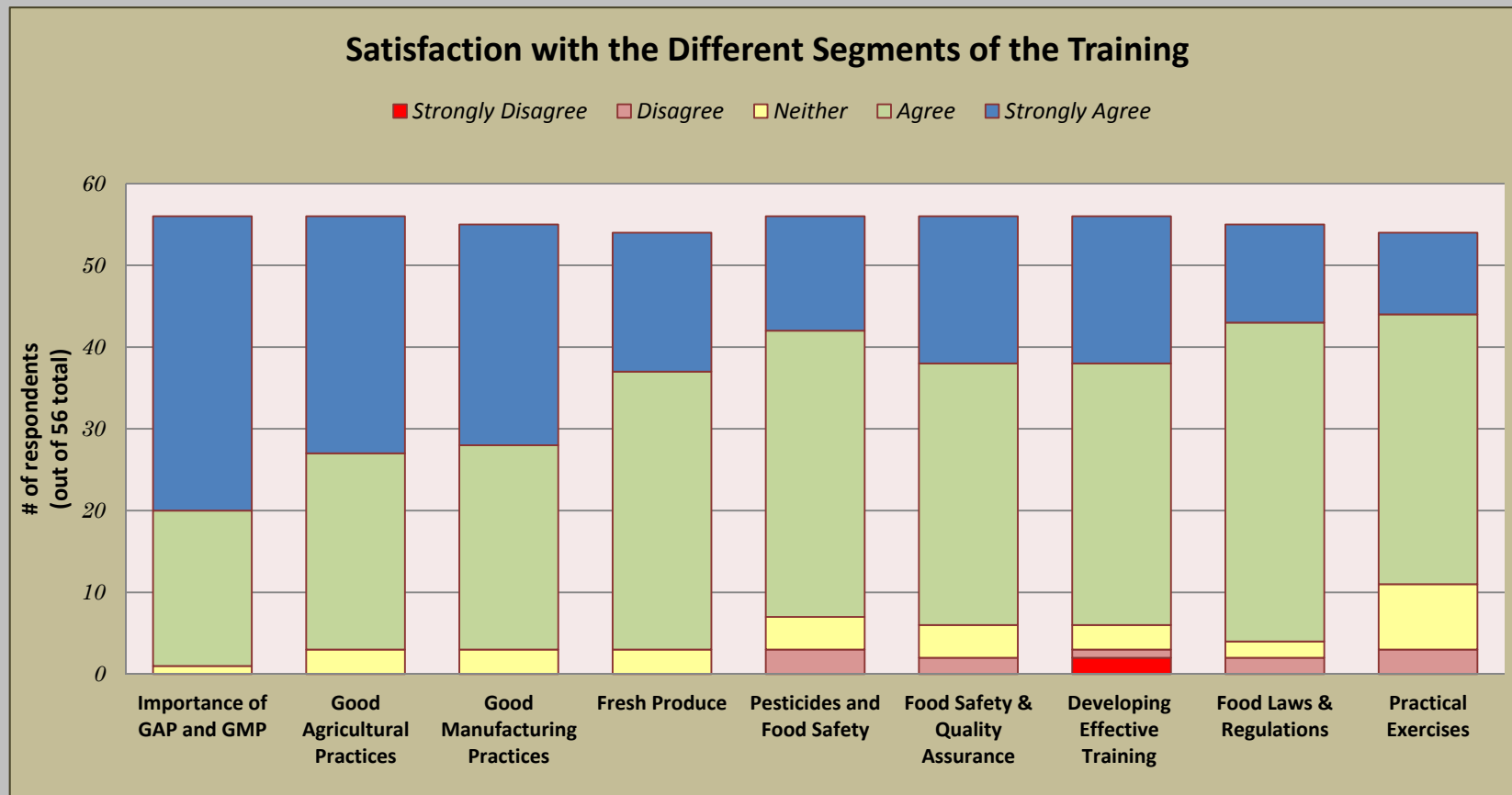
**Pre-training: Participants reported barriers: Country Infrastructure**



# Metrics – 1<sup>st</sup> Process Indicators Self-Assessment



# Metrics – 1<sup>st</sup> Process Indicators Self-Assessment



# Metrics – 2<sup>nd</sup> Process Indicator

## Factual Test



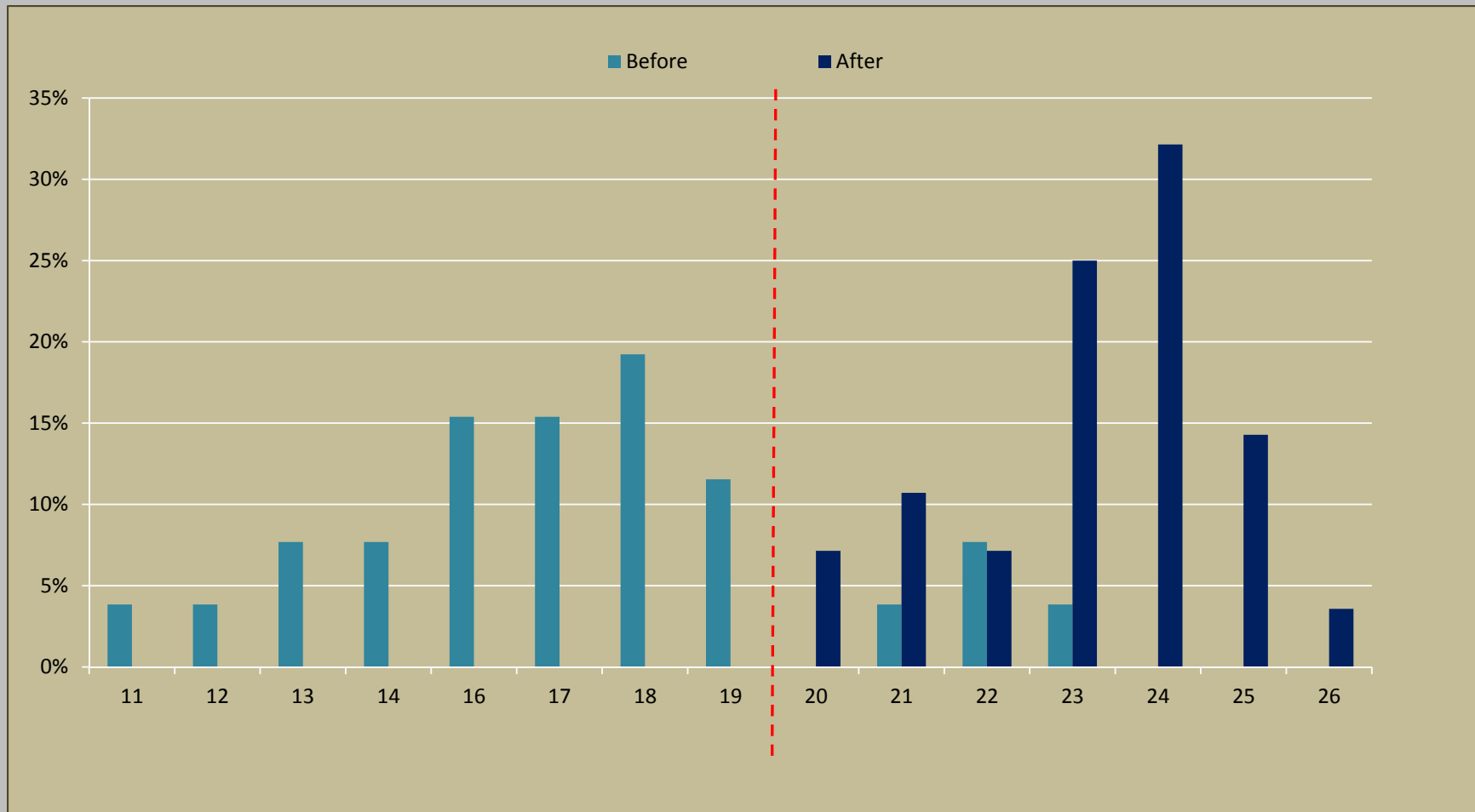
- ❖ Provides a quantifiable measure on the impact of the training program;
- ❖ Survey tests administered in class via ‘digi-voting’ to make it pleasant and interactive for the trainees; results displayed on PowerPoint;
- ❖ Anonymous - answer fall in a bar chart vis-à-vis the other students;
- ❖ Enables us to gauge what people learned during the training, and identify potential areas where improvement is needed

Keypad #	001	002	003	004	005	006	007	008	009	010	012	✓	*	Score	Pass/Fail
1	✓	*	✓	✓	✓	*	✓	✓	*	✓	*	7	4	64%	Fail
26	✓	*	*	✓	✓	*	✓	*	*	✓	*	5	6	45%	Fail
22	✓	*	✓	✓	✓	✓	✓	✓	*	✓	*	8	3	73%	Fail
7	✓	✓	*	✓	✓	*	*	*	✓	✓	✓	7	4	64%	Fail
24	✓	✓	*	✓	✓	✓	✓	*	*	✓	*	7	4	64%	Fail
25	*	*	*	✓	✓	✓	✓	✓	*	*	✓	6	5	55%	Fail
27	✓	*	*	✓	*	*	*	✓	*	*	*	3	8	27%	Fail
35	*	*	✓	✓	✓	*	✓	*	*	✓	*	5	6	45%	Fail
9	*	✓	*	*	✓	*	*	*	*	*	*	2	9	18%	Fail
16	*	✓	*	✓	✓	*	✓	*	✓	✓	*	6	5	55%	Fail
10	✓	*	✓	✓	✓	*	*	✓	*	*	*	5	6	45%	Fail
11	✓	*	✓	*	✓	*	*	*	✓	*	*	5	6	45%	Fail
21	*	✓	✓	✓	✓	✓	✓	*	*	✓	*	7	4	64%	Fail
6	*	*	✓	✓	✓	*	✓	*	✓	✓	✓	7	4	64%	Fail



# Metrics – 2<sup>nd</sup> Process Indicator

## Factual Tests



# Metrics

## 1<sup>st</sup> and 2<sup>nd</sup> Process Indicators



### Some socio-economic factors

	Category of Age		
	25-34 years	35-44 years	45-54 years
Observations	17	7	2
Pre test	16.5	18.4	17.0
Post test	23.6	22.4	22.0
Change	7.1	4.0	5.0

	Bachelor	Master
Observations	19	7
Pre test	16.68	18.14
Post test	23.32	22.71
Change	6.63	4.57

	Private	Public
Observations	3	23
Pre test	14.0	17.5
Post test	22.7	23.2
Change	8.7	5.7

### Correlation between self assessment and test scores

- ❖ For some trainings there is a strong and significant correlation between the difference in the participants' own self ranking before and after the training and the exponential of the improvement in the test result.





# Outcome Indicators



- ❖ Piloting 6-12 months after initial training in countries and with IFSTL trainings:
  - What did participants learn during the training that they were able to incorporate into their own training programs?
  - Did the participants incorporate best practices into their operations? If not, then why?
  - Determining if there was a multiplier effect (i.e., how many additional trainings occurred)
- ❖ Information obtained will assist partners in understanding what people were able to incorporate into their own trainings, what further type of trainings they feel is needed, and the multiplier effect.
- ❖ Process of administering these in Honduras, Ecuador, Vietnam using googledocs, will begin follow up for labs this fall



# Impact evaluation-attribution (Fall 2013)

- ❖ Using secondary data (see if can link outcome to impact)
  - Reduction in rejection of imported product from countries with training (look to us FDA data)
  - Increase in rejection rate in countries (by inspectors who participated in the training)
  - Reduced foodborne disease from people traveling aboard
  - Ultimately reduction in foodborne disease in countries where food produced (spillover effects)

# Status of Administration of Surveys



## ❖ Piloting approach 1.5 years

- End of the year administered 4-5 survey instruments in ~ 40 courses
- To date:
  - GAP- Honduras (regional), India, Ecuador, Jamaica, México
  - GAqP- India (3x), Vietnam
  - FIT - China
  - Lab – 8 X
  - Risk Analysis – 9 X (w/o Overview)



# Nine Main Gaps in Developing Country Systems



## Government standard-setting body

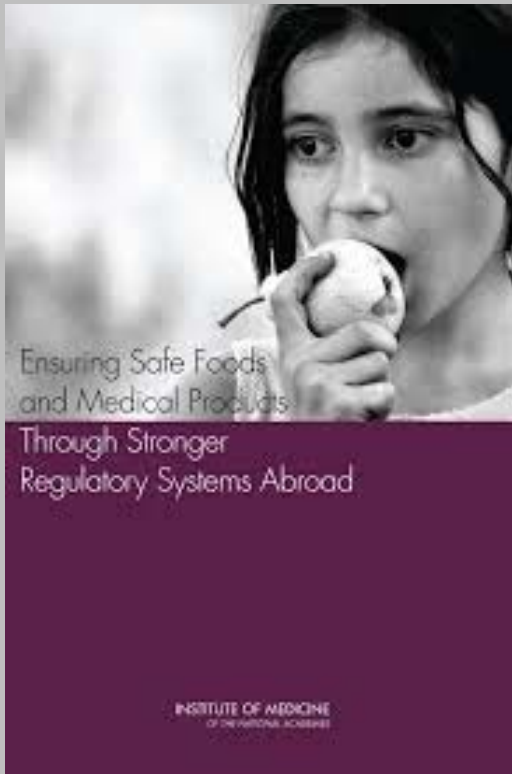
- ❖ Adherence to standards
- ❖ Controlling supply chains
- ❖ Infrastructure deficits
- ❖ Legal Foundation
- ❖ Workforce Problems
- ❖ Fragmentation
- ❖ Poor Surveillance Systems
- ❖ Communications
- ❖ Political Will



Ensuring Safe Foods and Medical Products through Stronger Regulatory Systems Abroad



# Core Elements of Regulatory Systems



## Government standard-setting body

- ❖ Use science and risk as a basis for developing policy;
- ❖ Participate in international cooperation and harmonization of standards;
- ❖ Make ethical decisions and recognize, collect, and transmit evidence when breaches of law occur.

## A food product regulatory system integrates:

- ❖ Product safety through good manufacturing, laboratory, and agricultural practices;
- ❖ Staff development and training for employees;
- ❖ Monitoring and evaluation of product quality using laboratories;
- ❖ Inspection and surveillance of products throughout the supply chain; and
- ❖ Risk assessment, analysis, and management; and
- ❖ Emergency response







Questions?

