FSIS Work Measurement Project

Final Briefing

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Agenda

- Introduction / USDA FSIS
- Problem Statement
- Fall 2013 – Project History
- Approach
- Project Outcome
- Recommendations

Introduction

US Department of Agriculture (USDA)

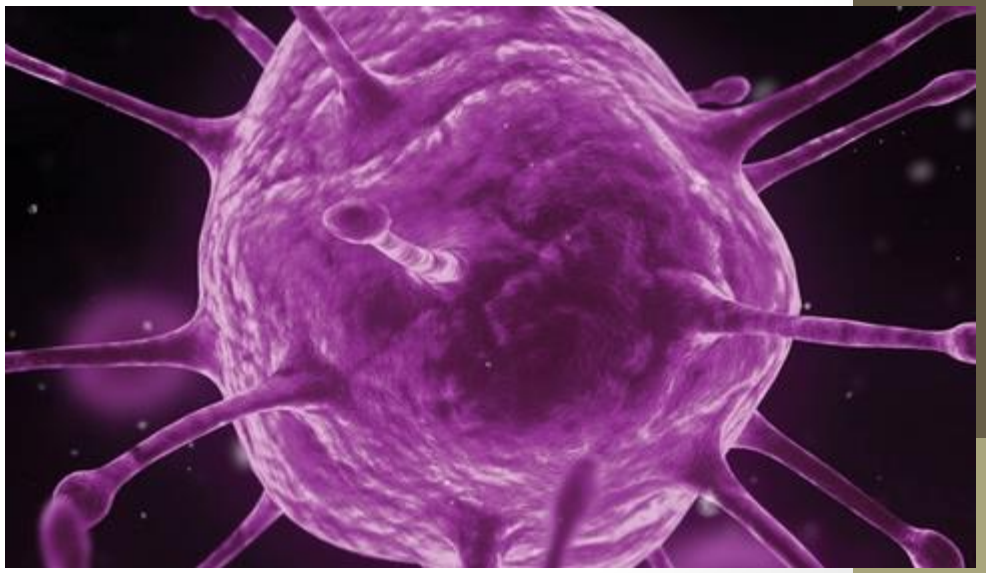
Food Safety & Inspection Service (FSIS)

- Mission: Safety of meat, poultry and egg products
- 3200 Consumer Safety Inspectors (CSIs) who cover over 5000 plants
- Work measurements
  - Direct Time, Indirect Time, Internal Travel, External Travel
  - Public Health Information System (PHIS) for workload scheduling
  - Prime component of annual budget request to US Congress
  - Indirect Multiplier: Account for Indirect Activities

    Indirect Time = Indirect Multiplier x Direct Time

Problem Statement

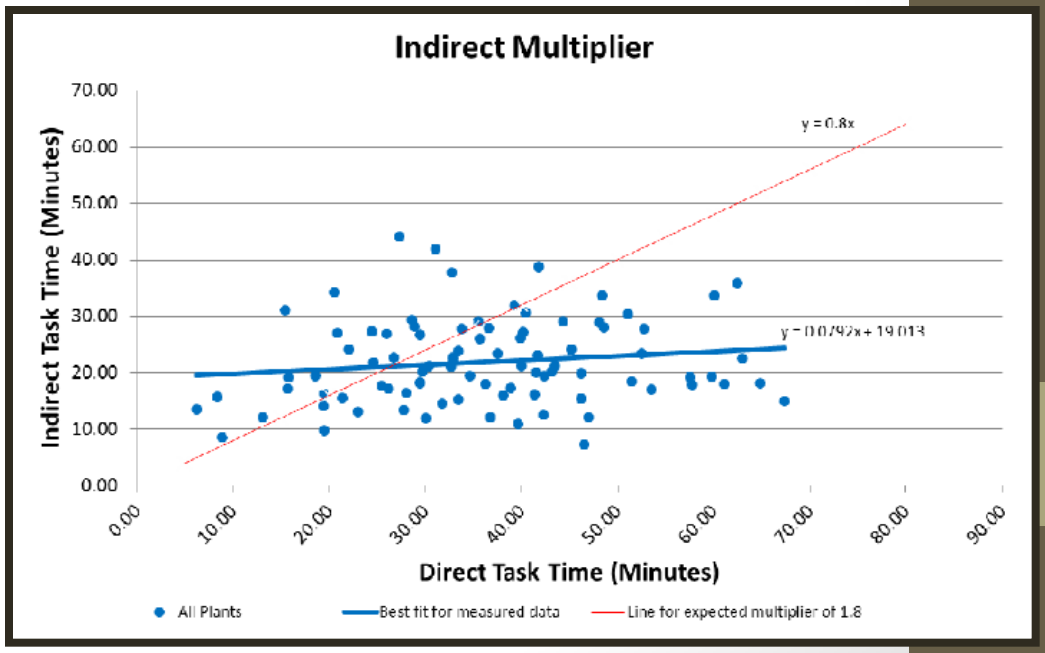
- FSIS requires a well-defined, justifiable, defensible, methodology for calculating work measurements for the N60 sampling to include direct and indirect time.
- FSIS requested GMU to perform a time study with union member participation to validate the Fall 2013 rejection of the 1.8 indirect multiplier.



Escherichia coli (E-Coli) O157:H7

Fall 2013 – Project History

- Initial analysis found no correlation between indirect and direct time – no valid multiplier could be found.
- Several Project Challenges:
  - Supervisors (FLS) vs Inspectors (CSI) due to labor management agreement
  - 82% DCS usability for analysis
    - Blank/Incomplete Forms
    - Sequencing Errors
  - Government Shutdown

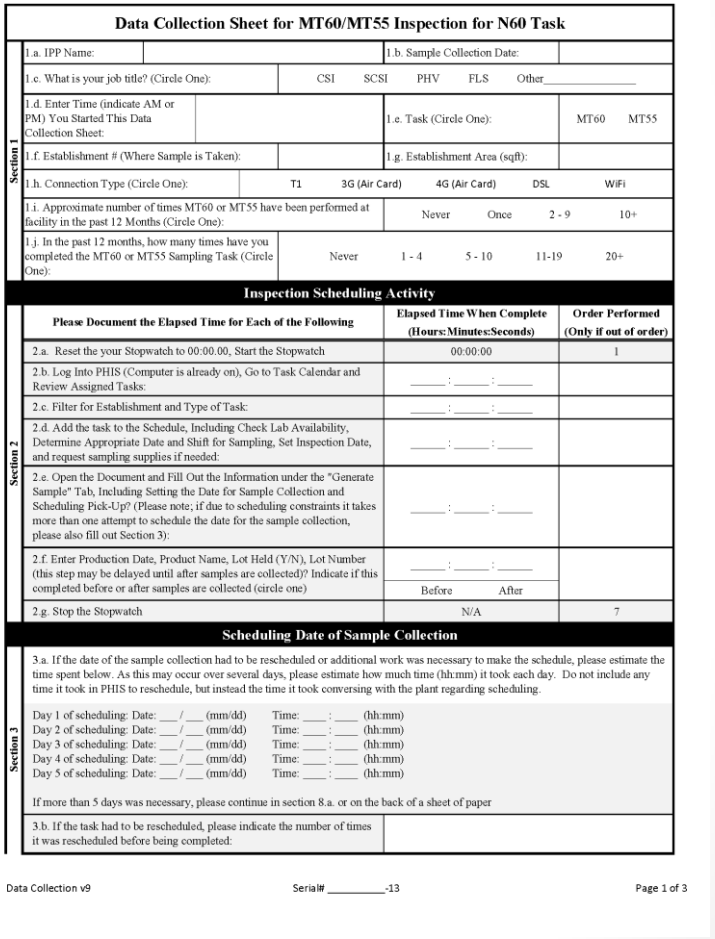


Approach

- Frequent meetings with our FSIS POC, Nick Bauer, and SMEs
- Adapted to challenges
- Performed Time Study with Updated Data Collection Sheets
  - Feedback from Fall 2013 Project Team
  - Demonstration of scheduling system
  - Conversations with FSIS employees familiar with the process
- Training
  - Online and phone based training
  - Several different sessions (Morning, Noon, Evening and Night)
- Site Visit
  - Further understanding of FSIS mission
  - Feedback from CSIs on the Data Collection Sheet
- Analysis of both Fall 2013 data and Spring 2014 data

Data Collection Sheet

- Expanded to include data scheduling
- Added Sequencing Column
- Included participant experience with N60
- Anticipated responses from Collective Bargaining Unit volunteers
- Updated instruction sheet



Data Collection Sheet for MT60/MT55 Inspection for N60 Task

Section 1

1.a. IPP Name:		1.b. Sample Collection Date:	
1.c. What is your job title? (Circle One):	CSI SCSI PHV FLS Other_____		
1.d. Enter Time (indicate AM or PM) You Started This Data Collection Sheet:		1.e. Task (Circle One):	MT60 MT55
1.f. Establishment # (Where Sample is Taken):		1.g. Establishment Area (sqft):	
1.h. Connection Type (Circle One):	T1 3G (Air Card) 4G (Air Card) DSL WiFi		
1.i. Approximate number of times MT60 or MT55 have been performed at facility in the past 12 Months (Circle One):	Never Once 2 - 9 10+		
1.j. In the past 12 months, how many times have you completed the MT60 or MT55 Sampling Task (Circle One):	Never 1 - 4 5 - 10 11-19 20+		

Inspection Scheduling Activity

Section 2

Please Document the Elapsed Time for Each of the Following	Elapsed Time When Complete (Hours:Minutes:Seconds)	Order Performed (Only if out of order)
2.a. Reset the your Stopwatch to 00:00.00, Start the Stopwatch	00:00:00	1
2.b. Log Into PHIS (Computer is already on), Go to Task Calendar and Review Assigned Tasks:	_____ : _____ : _____	
2.c. Filter for Establishment and Type of Task:	_____ : _____ : _____	
2.d. Add the task to the Schedule, Including Check Lab Availability, Determine Appropriate Date and Shift for Sampling, Set Inspection Date, and request sampling supplies if needed:	_____ : _____ : _____	
2.e. Open the Document and Fill Out the Information under the "Generate Sample" Tab, Including Setting the Date for Sample Collection and Scheduling Pick-Up? (Please note; if due to scheduling constraints it takes more than one attempt to schedule the date for the sample collection, please also fill out Section 3):	_____ : _____ : _____	
2.f. Enter Production Date, Product Name, Lot Held (Y/N), Lot Number (this step may be delayed until after samples are collected)? Indicate if this completed before or after samples are collected (circle one)	_____ : _____ : _____ Before After	
2.g. Stop the Stopwatch	N/A	7

Scheduling Date of Sample Collection

Section 3

3.a. If the date of the sample collection had to be rescheduled or additional work was necessary to make the schedule, please estimate the time spent below. As this may occur over several days, please estimate how much time (hh:mm) it took each day. Do not include any time it took in PHIS to reschedule, but instead the time it took conversing with the plant regarding scheduling.

Day 1 of scheduling: Date: ___ / ___ (mm/dd) Time: ____ : ____ (hh:mm)
Day 2 of scheduling: Date: ___ / ___ (mm/dd) Time: ____ : ____ (hh:mm)
Day 3 of scheduling: Date: ___ / ___ (mm/dd) Time: ____ : ____ (hh:mm)
Day 4 of scheduling: Date: ___ / ___ (mm/dd) Time: ____ : ____ (hh:mm)
Day 5 of scheduling: Date: ___ / ___ (mm/dd) Time: ____ : ____ (hh:mm)

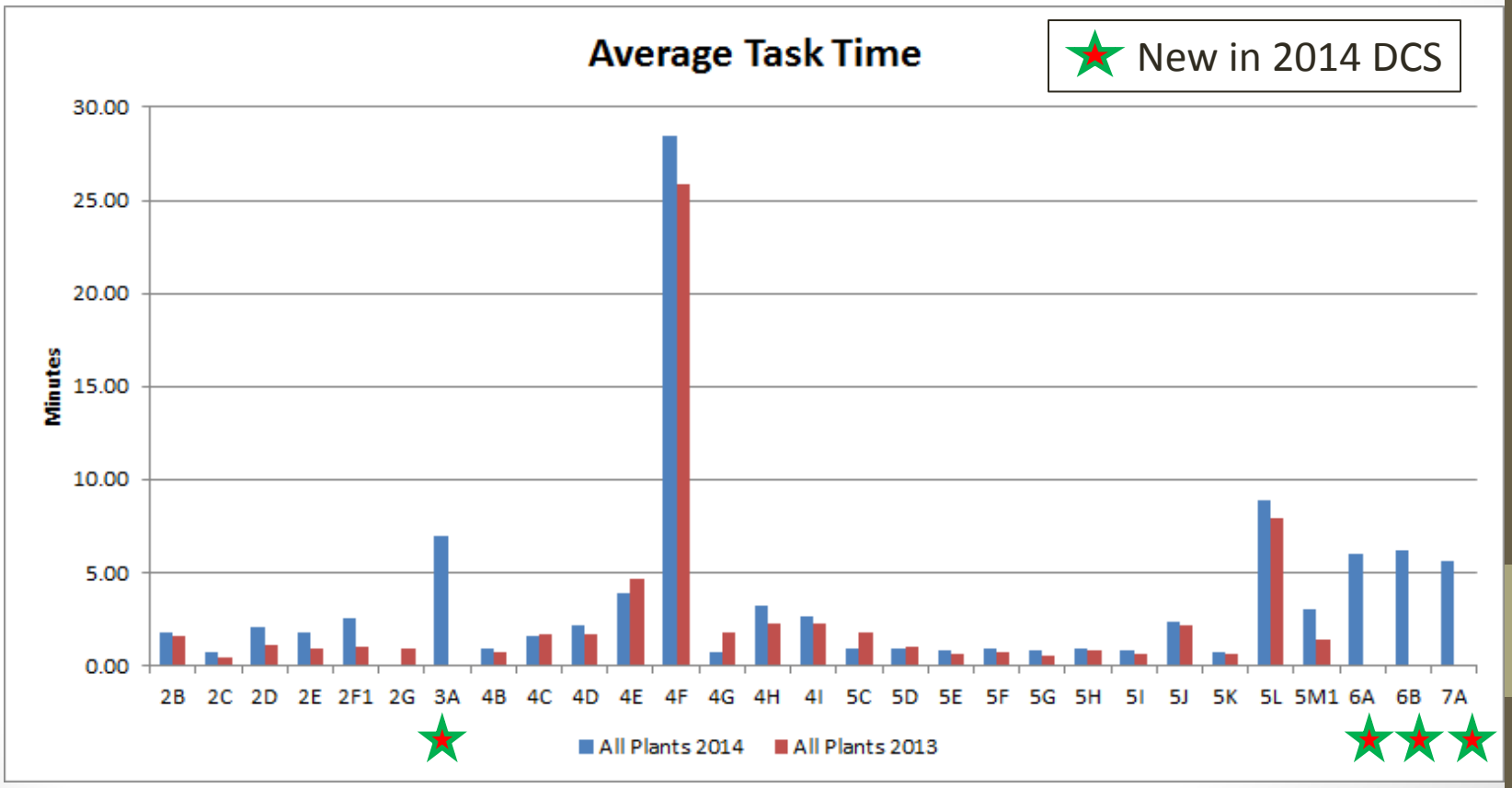
If more than 5 days was necessary, please continue in section 8.a. or on the back of a sheet of paper

3.b. If the task had to be rescheduled, please indicate the number of times it was rescheduled before being completed:	

Data Collection v9 Serial# _____-13 Page 1 of 3

2013/2014 DCS Comparison

- 2014 Time Study included new tasks on DCS
- Focus across HACCP (Hazard Analysis and Critical Control Point) size establishments



Value of Training

- Conducted 7 online webinar conferences
  - Interactive walkthrough of DCS
  - Question/Answer sessions
- 94% DCS usability rate
  - 79 used in analysis out of 84 total received
  - 3 DCS blank due to no N60 scheduled at plant
  - 1 DCS had a missing page during shipping
  - 1 DCS was incomplete

Site Visit to Plant

- JBS Packerland in Sauderton, PA
  - Patties for a major fast food chain's east coast locations
  - 2,000 cattle/day
- N60 vs 2 Pound Grab
- USDA role in plant
- Indirect time variation per plant

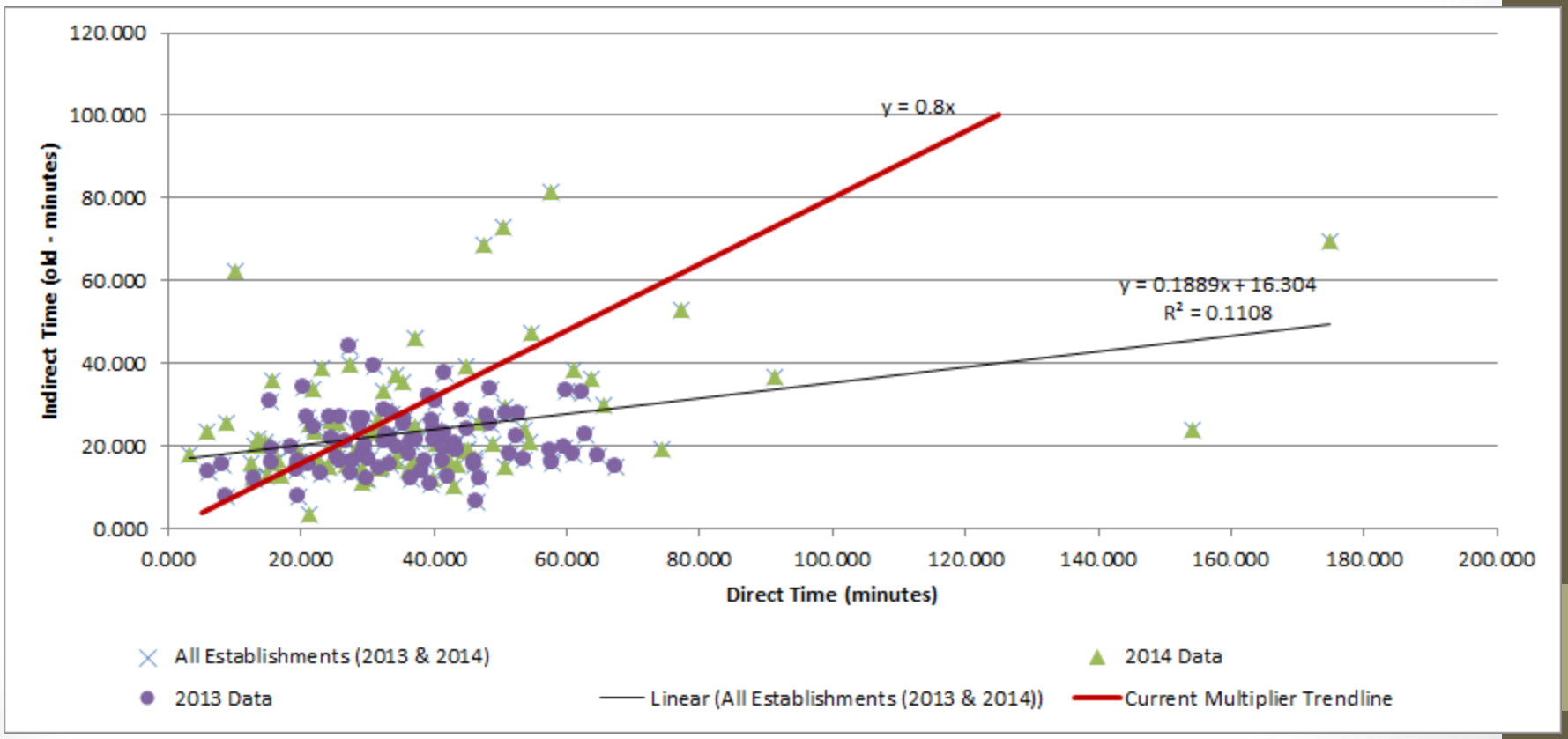
Courtesy of USDA FSIS N60 Sampling Update Video, March 2010

Analysis of the Results

- Broken into 2 sections
  - 2013/2014 Data
    - Combined data set from the two semesters with appropriate task items removed
    - Explore the indirect multiplier across a larger sample
  - 2014 Data
    - Only 2014 data that includes new task items
    - Explore the indirect multiplier with new task items
    - Conduct ANOVA and Median tests on several parameters

2013/2014 Indirect vs Direct

- Plot of 2013 and 2014 indirect time vs direct time
  - Currently methodology an indirect multiplier of 0.8 of the direct time



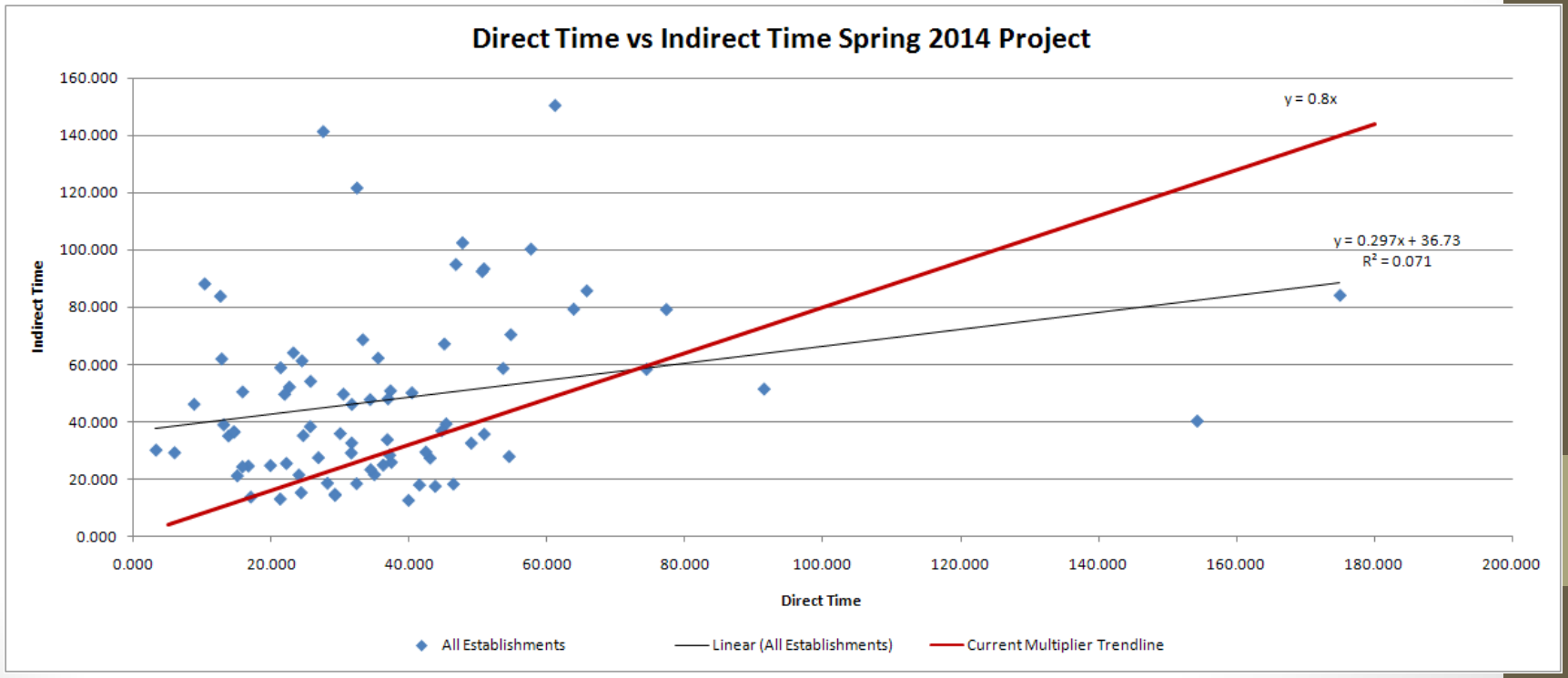
Indirect vs Direct Analysis

- Analysis between the two semester's DCS
  - Higher standard deviations with the combined data
    - Did not remove outliers from the 2014 data
    - Of all the establishments sampled, 63% of them were new this semester
    - Slightly different population sampled with CSI's
  - With combined data, indirect is 63% of direct time compared to 61% last semester

	Average	Std. Dev.	95% CI	99% CI	Sensitivity
2013 Data					
Indirect	21.0	7.2	+/- 1.5	+/- 2.0	0.5
Direct	36.1	13.7	+/- 2.9	+/- 3.9	0.9
Total	57.1	16.4	+/- 3.5	+/- 4.6	1.1
2013/2014 Data					
Indirect	23.2	11.9	+/- 1.8	+/- 2.4	0.6
Direct	36.7	20.9	+/- 3.2	+/- 4.2	1.0
Total	59.9	27.2	+/- 4.2	+/- 5.5	1.3

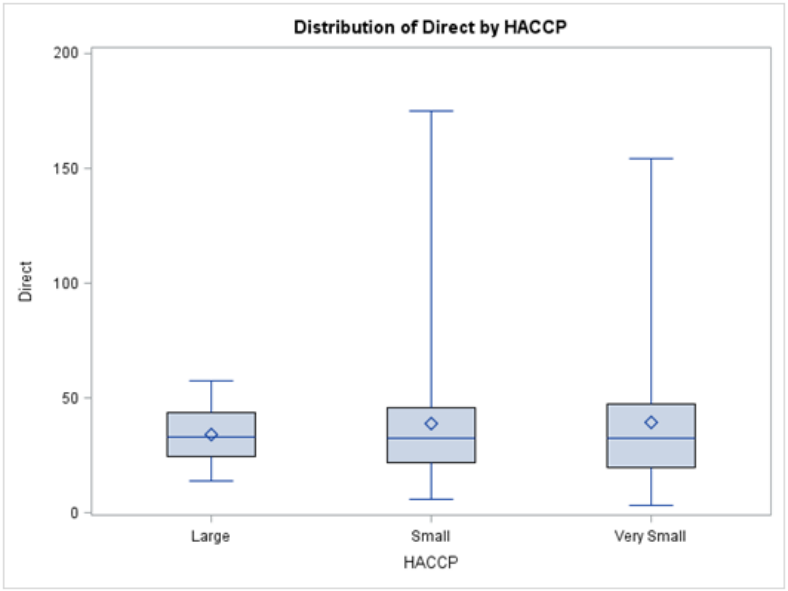
2014 Analysis

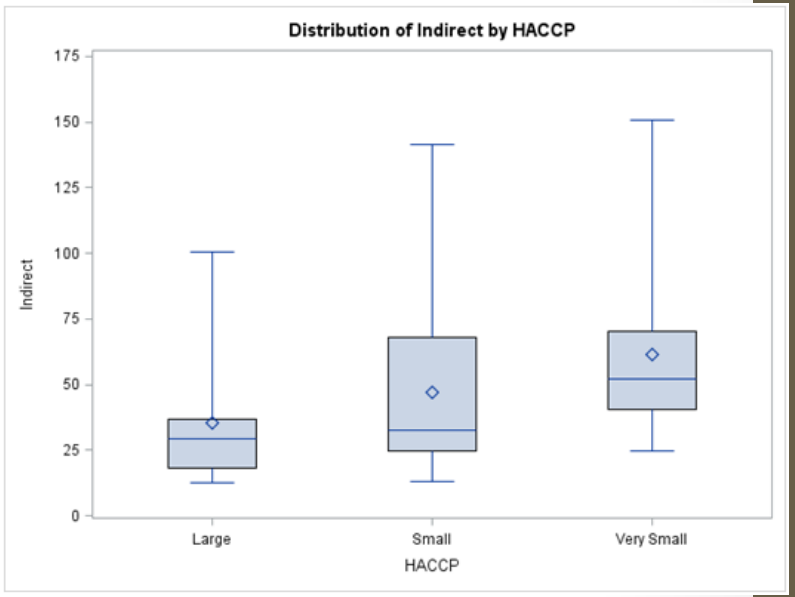
- Plot of Indirect Time vs Direct Time
  - Currently methodology an indirect multiplier of 0.8 of the direct time
  - Still doesn't suggest a trend line is the best fit for the data
  - Focus on HACCP establishment size



2014 Indirect vs Direct

- ANOVA test the null hypothesis that the population means for all groups are the same





Direct Time	p-value	0.747810705	
Groups	*Count*	*Average*	*Standard Dev*
Very Small	25	39.28	32.44
Small	28	38.69	31.19
Large	26	34.05	12.61

Indirect Time	p-value	0.005463826	
Groups	*Count*	*Average*	*Standard Dev*
Very Small	25	61.63	29.62
Small	28	47.16	31.45
Large	26	35.28	22.42

ANOVA – HACCP Size

- If the null is rejected, it could imply that just one of the groups means is statistically different
- Analysis performed on the different pairs of HACCP size establishments
  - Based on results combined Very Small and Small into one group
  - Sponsor has already initiated a new project to update the way very small and small plants are scheduled

HACCP Size	P-value
Very Small vs Small	0.095
Very Small vs Large	0.000
Small vs Large	0.119
Very Small/Small vs Large	0.008

ANOVA – Parameters

- ANOVA and Median tests performed across several different parameters

Parameter	Indirect (ANOVA)	Indirect (Median)	Direct (ANOVA)	Direct (Median)
HACCP Size	Reject	Reject	Can't Reject	Can't Reject
Connection Type	Can't Reject	Indeterminate	Can't Reject	Can't Reject
Plant Size (sq foot)*	Reject	Reject	Can't Reject	Can't Reject
Facility Experience	Reject	Reject	Can't Reject	Can't Reject
Inspector Experience	Reject	Reject	Can't Reject	Can't Reject
District**	Can't Reject	Can't Reject	Reject	Can't Reject

*Inconsistency in data along with relation to HACCP Size

**Need more data points to fully reject this parameter

Scheduling Time

- By HACCP Size
  - ANOVA test: ***Reject***
  - Median test: ***Indeterminate***

HACCP Size	Average Scheduling	Std. Dev. Scheduling
Very Small	19.9	21.7
Small	15.1	20.1
Large	7.0	6.7

  - Rescheduling
    - Very Small: 7 of the 25 rescheduled 11 times
    - Small: 3 of the 28 rescheduled 4 times
    - Large: No rescheduling

- By Connection
  - ANOVA and Median tests: ***Can't Reject***

HACCP Size	Average Scheduling	Std. Dev. Scheduling
DSL	14.3	19.8
Aircard	17.1	18.2
T1	5.8	6.3
WIFI	13.8	6.2

  - Connection can vary from plant they scheduled and where they take the sample

Project Outcome

- The time study does not support the validity of the indirect multiplier approach:
  - Trend line did not suggest a linear relationship
  - 2014 data had an average indirect time that is 128% of direct time, or a multiplier of 2.28
- The time study found differences in average indirect times between very small/small and large establishments
  - Very Small: 157%
  - Small: 122%
  - Large: 104%

Recommendations

- Investigate alternative methodologies
- Update methodology based on HACCP plant size
- Further analysis into Scheduling Time and Connection type
- Situations Sample Scheduled but not taken
- Evaluate the extent to which laboratory capacity constrains sample scheduling

Special Thanks

- Dr. Regina Tan – Project Sponsor
- Nick Bauer – FSIS Lead POC
- William Griffin, Misha Robyn, Lynvel Johnson, Charles Gioglio, and Robert Cooke
- Fall 2013 GMU Project Team
  - Christopher Bang, Amanda Kryway, Scott Motter, Karen Tung
- Dr. Larry Tang and Harutyun Hovsepyan
- JBS Sauderton

Questions?