

Secondary Agriculture Educators' Perception of the Importance and Capability of Teaching Agricultural Food Science

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Introduction & Theoretical Framework

- Throughout the last decade, numerous research reports have highlighted the importance of food science and its critical role in maintaining the nation's food supply (Marsh & Bugusu, 2007).
- Food and Meat Science is not mandated as a curriculum in secondary education. It is, however, discussed as skills through certain classes in the State of Texas Agricultural Science courses: Advanced Animal Science, Food Technology and Safety, Food Processing.
- In 2016, Texas Examinations of Education Standards introduced a new certification domain known as "Food Science and Processing" to the 272 6-12 Agriculture, Food and Natural Resource test.
- The Borich Needs Assessment Model measures the agriculture educator's perceived level of importance and perceived level of accomplishment through mean weighted discrepancy score (Lester, 2012).
- Bandura's (1994) self efficacy theory "perceived self-efficacy is concerned with people's beliefs in their capabilities to produce a given attainment." (p. 307).
- Evidence indicates peoples level of self-efficacy correlates to their self-esteem, outcome-expectancies, and locus of control (Bandura, 2006).

Purpose & Research Objectives

Purpose

- The purpose of this study was to describe secondary agriculture educators' perceptions of the importance of, and their ability to teach selected agriculture food science skills in a formal secondary education setting.

Research Objectives

- Describe the demographic characteristics of participating agriculture educators.
- Describe the importance of selected agriculture food science content areas as perceived by secondary educators.
- Describe the perceived capability of secondary agricultural educators who teach agricultural food science content areas.
- Determine the discrepancy between the importance of agricultural food science content areas and the capability to teach agricultural food science areas as perceived by secondary agriculture educators.

Importance, Ability, and Mean Weighted Discrepancy Scores of General Food Science Competencies

General Food Science Competencies	Importance		Ability		MWDS
	M	SD	M	SD	
Identify new technology innovations in the food industry.	4.12	.70	3.26	.77	3.56
Research regulations for food products in the processing industry.	4.11	.75	3.33	.81	3.21
Research environmental issues in food production.	3.95	.78	3.30	.71	2.57
Identify major industries and organizations in food production.	3.96	.82	3.36	.72	2.34
Analyze financial trends in food production.	3.72	.86	3.15	.76	2.11

*Scale: 1 = no importance, 2 = slightly important, 3 = moderately important, 4 = important, 5 = very important

Importance, Ability, and Mean Weighted Discrepancy Scores of Fabrication Competencies

Fabrication Competencies	Importance		Ability		MWDS
	M	SD	M	SD	
Identify all retail cuts.	4.28	.76	3.68	.87	2.58
Determine cuts by species.	4.27	.80	3.69	.85	2.44
Identify SPECS on merchandising products.	3.95	.85	3.38	.84	2.26
Identify wholesale cuts.	4.21	.82	3.68	.88	2.23
Definition of Fabrication.	4.12	.76	3.71	.81	1.68

*Scale: 1 = no importance, 2 = slightly important, 3 = moderately important, 4 = important, 5 = very important

Importance, Ability, and Mean Weighted Discrepancy Scores of Packaging System Competencies

Packaging System Competencies	Importance		Ability		MWDS
	M	SD	M	SD	
Identify labeling on food products.	4.23	.77	3.51	.80	3.08
Demonstrate correct labeling for food products.	4.10	.83	3.41	.83	2.85
Identifying food product storage.	4.05	.80	3.49	.80	2.30
Identify correct transportation for food products.	3.99	.80	3.42	.80	2.24

*Scale: 1 = no importance, 2 = slightly important, 3 = moderately important, 4 = important, 5 = very important

Importance, Ability, and Mean Weighted Discrepancy Scores of Slaughter Process Competencies

Slaughter Process Competencies	Importance		Ability		MWDS
	M	SD	M	SD	
Describe federal and state inspection laws.	4.33	.72	3.68	.89	2.84
Physical components affecting meat quality.	4.33	.70	3.72	.84	2.67
Postmortem factors affecting meat quality.	4.27	.70	3.69	.86	2.49
Antemortem factors affecting meat quality.	4.24	.73	3.66	.86	2.49
Describe the slaughter process.	4.33	.75	3.94	.80	1.66
Describe the splitting, washing, and cooling process.	4.11	.76	3.77	.89	1.40

*Scale: 1 = no importance, 2 = slightly important, 3 = moderately important, 4 = important, 5 = very important

Importance, Ability, and Mean Weighted Discrepancy Scores of USDA Grading System Competencies

USDA Grading System Competencies	Importance		Ability		MWDS
	M	SD	M	SD	
Identify factors associated with quality and yield grades.	4.27	.74	3.71	.83	2.41
Definition of USDA quality grading system.	4.24	.74	3.69	.80	2.33
Define USDA yield grading system.	4.24	.74	3.71	.81	2.24
Assign USDA quality and yield grades.	4.11	.80	3.61	.85	2.06

*Scale: 1 = no importance, 2 = slightly important, 3 = moderately important, 4 = important, 5 = very important

Importance, Ability, and Mean Weighted Discrepancy Scores of Hazard Analysis Critical Control Points (HACCP) Competencies

HACCP Competencies	Importance		Ability		MWDS
	M	SD	M	SD	
Identify and describe the sanitation procedures for food products.	4.38	.70	3.43	.80	4.14
Explain temperatures for certain food storage.	4.32	.71	3.43	.80	3.83
Research food safety laws.	4.13	.79	3.39	.80	3.07
Definition of HACCP	4.12	.80	3.38	.85	3.06
Identifying 7 principles of HACCP.	4.06	.82	3.32	.90	3.01

*Scale: 1 = no importance, 2 = slightly important, 3 = moderately important, 4 = important, 5 = very important

Methodology

- A sense sample (n = 2064) was selected from the 2016-2017 VATAT directory to represent the population.
- Qualtrics survey sent to a panel of experts (n = 25) to verify content and face validity of the survey.
- Stratified sampling was used for a pilot test group (n = 30). This was conducted to ensure instrument reliability and resulting in acceptable α level for each construct (Cronbach's $\alpha > .75$).
- Dillman's Tailored Design Method was used when distributing the surveys (Dillman, 2009)
- A census survey was sent out to every agriculture educator in the State of Texas (n = 1967).
- Data was collected from surveys of agriculture educators who selected 'yes' to teaching one of the three classes (n = 206).
- Descriptive and inferential statistics were used to evaluate the data.

Conclusions & Recommendations

- The demographics to question one resulted in an agriculture educator being a white, male, with a bachelor's degree. The agriculture educator is employed for five years or less and teaches in a multi-teacher department; majority (n = 174) of the teachers did not have a laboratory facility.
- Every skill within the research needs further profession development due to the MWDS being a positive integer.
- Professional development should be used during the Vocational Agriculture Teachers Associate of Texas to enhance their understanding of the skills. Training certifications can be obtained during these training periods for the food science domain.

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