
UNDERSTANDING OF FOOD LABELING BY STUDENTS ENROLLED IN A CAPSTONE SENIOR SEMINAR IN AGRICULTURE

NACTA Conference, 2019

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Purpose of the Study

- To explore college student understanding of food label terms
- To compare understanding of food label terms by students majoring in an agricultural degree versus a degree outside of agriculture



Food Labeling



- Most consumers examine labels on food products at some level (Nagler & Hornik, 2012).
- Purchasing decisions are based on the consumer's ability to accurately decipher the advantages and disadvantages of products to meet their dietary needs.
- Danger in confusing messages about products when misattribution of health benefits leads to accepting persuasive marketing statements as scientific facts (Lindgren, 2018; Nielsen, 2018).
- Consumers should be knowledgeable about how food choices affect their health, understand food labels, and be conscious of the advertising tactics of the food industry (Ollberding, 2011; Sanlier & Karakus, 2010).

Example: Why Examining this Issue is Important

“One of the problems with the USDA definition for grass fed beef is that it has a loophole that allows for the use of grain “to ensure the animal’s well being at all times during adverse environmental or physical conditions.” One local grass fed beef company here in Virginia once disclosed to me that they have an internal policy with regard to this loophole that allows their farmers to feed up to 2% of the animal’s weight in grain per day during the winter months. Assuming that their cows weigh about 1000 pounds and given the fact that there are about 5 “winter months” in this part of the country, their policy would allow for each grass fed cow to be fed about 1.5 tons of grain per year. Amazingly, it can still be marketed as “grass fed beef.”

David Maren, Tendergrass Farms



Methods & Procedures



- This study utilized a descriptive survey design. Students enrolled in a capstone agricultural leadership course were asked to provide written definitions to seven food labeling terms. Ag Majors (n = 31), Non-Ag Majors (n = 26), N = 57 students
 - Researchers reviewed the definitions provided by students and independently categorized them as inaccurate (1), slightly accurate (2), or completely accurate (3). Once independently reviewed, the researchers met to discuss discrepancies and reach consensus.
 - Data was analyzed using descriptive statistics (mean, median, mode) and compared by category (ag/non ag majors).
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Organic



- Certified to have grown on soil that had no prohibited substances applied for three years prior to harvest.
- Prohibited substances include most synthetic fertilizers and pesticides.
- No artificial preservatives, colors, or flavors
- No GMOs
- As for organic meat, regulations require that animals are raised in living conditions accommodating their natural behaviors (like the ability to graze on pasture), fed 100% organic feed and forage, and not administered antibiotics or hormones.

Category	1-Inaccurate	2-Slightly Accurate	3-Completely Accurate
Ag	17	14	0
Non-Ag	15	9	1
Combined	32	23	1

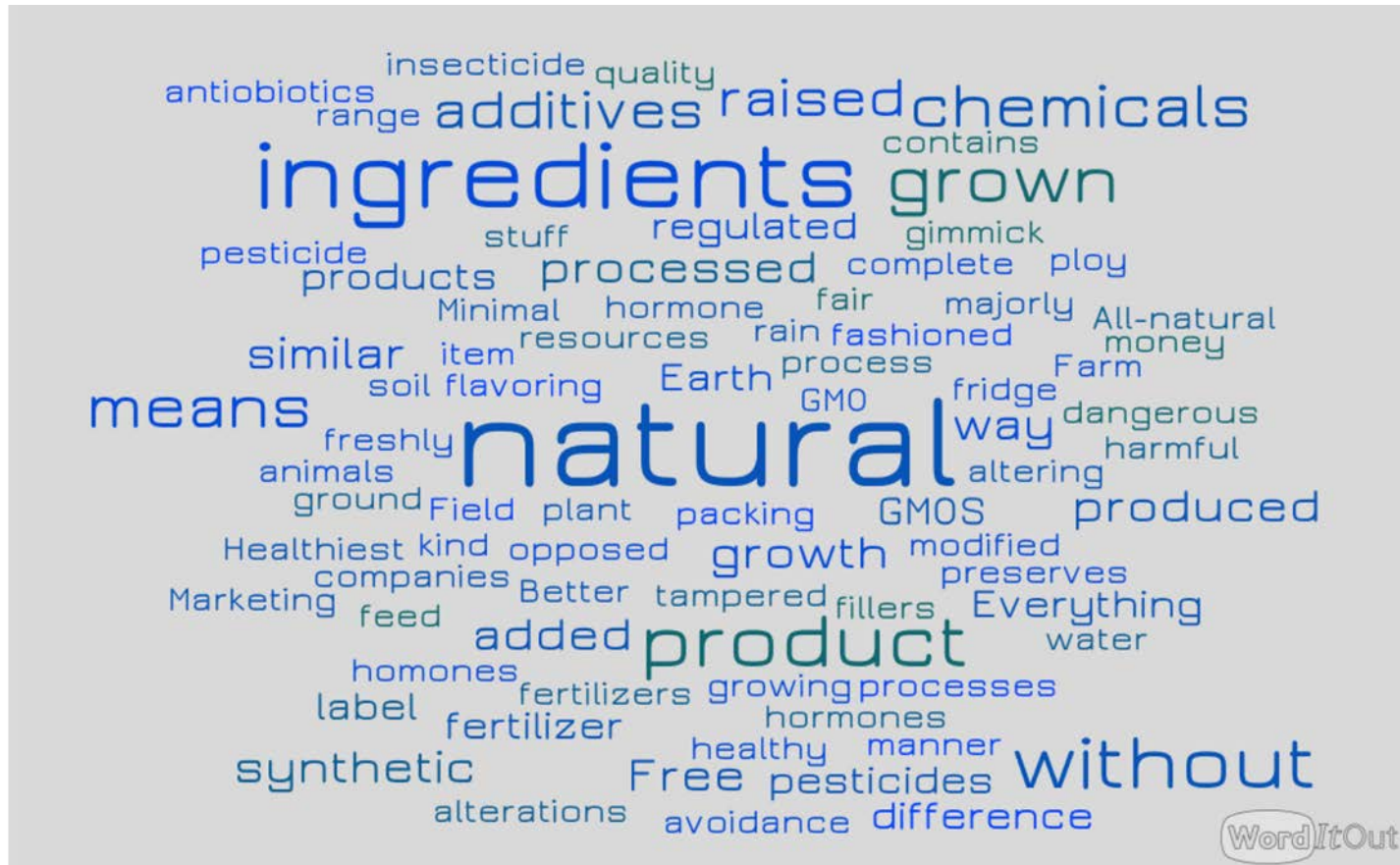
All-Natural



- The FDA (2019) has considered the term "natural" to mean that nothing artificial or synthetic (including all color additives regardless of source) has been included in, or has been added to, a food that would not normally be expected to be in that food.

Category	1-Inaccurate	2-Slightly Accurate	3-Completely Accurate
Ag	19	10	2
Non-Ag	17	3	5
Combined	36	13	7

All-Natural



Gluten-Free



- The FDA (2019) rule specifies that any foods that carry the label “gluten-free,” “no gluten,” “free of gluten,” or “without gluten” must contain less than 20 parts per million (ppm) of gluten

Category	1-Inaccurate	2-Slightly Accurate	3-Completely Accurate
Ag	13	6	13
Non-Ag	5	5	15
Combined	18	11	28

Gluten-Free



Free Range



- Producers must demonstrate to the Agency that the poultry has been allowed access to the outside. (USDA, 2019)

Category	1-Inaccurate	2-Slightly Accurate	3-Completely Accurate
Ag	12	16	4
Non-Ag	19	6	0
Combined	31	22	4

Cage-Free



- Eggs packed in USDA grade marked consumer packages labeled as cage free must be produced by hens housed in a building, room, or enclosed area that allows for unlimited access to food, water, and provides the freedom to roam within the area during the laying cycle (FDA, 2019).

Category	1-Inaccurate	2-Slightly Accurate	3-Completely Accurate
Ag	7	6	19
Non-Ag	11	3	11
Combined	18	9	30

Non-GMO



- “An organism that was not produced through genetic modification” (USDA, 2019).

Category	1-Inaccurate	2-Slightly Accurate	3-Completely Accurate
Ag	10	4	18
Non-Ag	10	5	10
Combined	20	9	28



CORN (33)



POTATOES (6)



SOYBEANS (20)



COTTON (16)



CANOLA



SQUASH (2)



SUGARBEETS (1)



ALFALFA (2)



PAPAYAS (2)



APPLES (1)

THERE ARE ONLY
10 GMO CROPS

APPROVED BY THE USDA
GROWN IN THE UNITED STATES



Grass-Fed



- “Animals be fed only grass and forage, with the exception of milk consumed prior to weaning” (USDA, 2019)

Category	1-Inaccurate	2-Slightly Accurate	3-Completely Accurate
Ag	4	11	17
Non-Ag	6	8	11
Combined	10	19	28

Percentage of Students' Scoring of Food Labels as Completely Accurate or Slightly Accurate



Term	Ag (% of Students)	Non Ag (% of Students)	Difference (% of Ag - Non-Ag)
Free-Range	65	24	41
Cage Free	81	56	25
Grass Fed	90	72	18
Non-GMO	70	60	10
All-Natural	39	32	7
Organic	45	40	5
Gluten-Free	61	80	-19

Conclusions



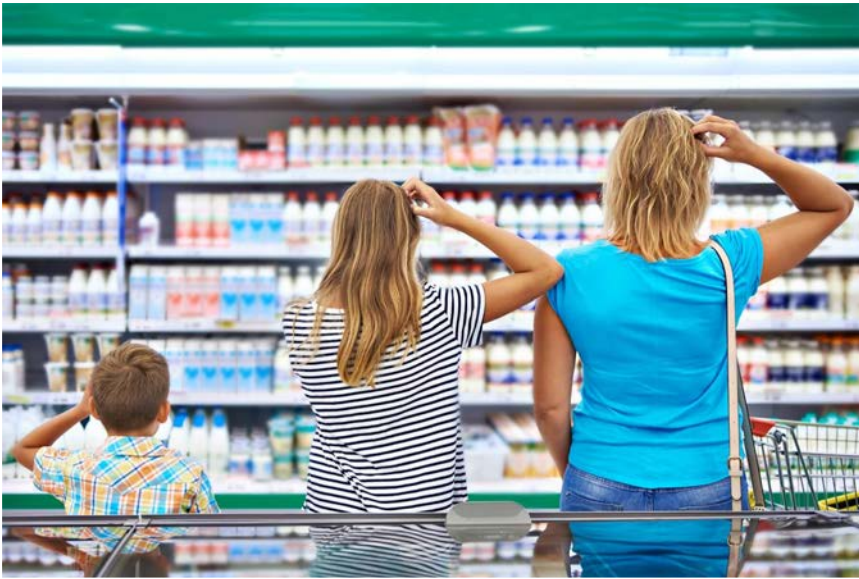
- The term that was most accurately defined among all students was “cage-free.”
 - The term that was least accurately defined among all students was “all-natural.”
 - The terms that were more accurately defined (completely accurate or slightly accurate) by students with coursework in agriculture compared to students without coursework in agriculture were: grass-fed, non-GMO, cage-free, free-range, all-natural, and organic.
 - The term that was more accurately defined (completely accurate or slightly accurate) by students without coursework in agriculture compared to students with coursework in agriculture was gluten-free.
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Conclusions continued

- In examining the percentage of students who more accurately defined (completely accurate or slightly accurate), Ag majors scored higher across all labels with the exception of Gluten-Free.
- While both groups show a need for additional education, the Ag majors tended to more accurately define the food labels.
- For some food label terms, Ag students were just as inaccurate as the Non-Ag majors.



Recommendations



- Opportunities abound to education our students on the meaning of food labels
- Assuming college-educated students generally know more about food labels than the general population, a need exists to educate consumers broadly about food labels
- Misinformation exists regarding food labels; some is purposeful to market products which leads to greater consumer confusion

Questions?

Thank you!
