NATIONAL CENTER FOR CASE STUDY TEACHING IN SCIENCE

Aisles of Confusion:

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Amari is a college freshman coming home to visit family over winter break, and is at the grocery store with their mom and younger sibling Cameron.

Amari: What's for dinner tonight, Mom? I can't wait for a home-cooked meal.

Mom: I'm making chicken tacos. I need to get some good food in you while I can. Who knows what kind of junk you eat when you're away at school.

Amari: Sounds good!

Mom: The only problem is that your Aunt Jen is coming over for dinner, and she's really into "clean eating" right now, so I have to find ingredients without gluten, MSG, GMOs, and a bunch of other stuff on this list.

Amari: I don't even know what that all means, Mom, or how to look for that stuff.

Mom: Between you and me, I'm not sure your aunt really knows what it means either. Can you and Cameron go get the chicken, some tomatoes, an onion, and some cilantro? I'll grab the taco seasoning, the tortillas, and a few other things, then we can meet at the front of the store.

Amari and Cameron walk to the meat department.

Cameron: I love tacos, I can't wait to eat like 50 of them. Chicken are my favorite. Do you have good tacos at school? What is college like anyway?

Amari: Well, it's definitely not what the movies make it out to be. College is a lot different than high school.

Cameron: Mom said to get chicken but look at all of these choices! No added hormones, cage free, antibiotic free, free range. Would any of these have gluten or MSG in them? What does all of this mean?

Amari: It means it's more expensive! Look at the prices! Let's just grab the cheapest one.

Cameron: Wait a second. Mom may want one of those other options. Think about Aunt Jen! Jeez. We better just wait and ask her. Let's just go get the tomatoes and onions.

Amari and Cameron head over to the produce department.

Amari: Really!? Four different kinds of tomatoes? These look like the regular ones, but then there are non-GMO, organic, and locally grown kinds as well. Which of these would be most healthy or "clean"?

Amari and Cameron return empty-handed to Mom in the aisle near the tortillas.

Cameron: Mom, we failed. There were too many choices, so we weren't sure what Aunt Jen would want.

Mom: What do you mean? I just asked for chicken and few veggies.

Cameron: There were all of these labels like antibiotic free, free range, non-GMO, organic ...

Mom: Hmm, I see what you mean; it took me awhile but I finally found the seasoning without MSG and tortillas that were both gluten free and non-GMO. I hope this doesn't affect my recipe.

Amari: Do any of these labels really mean anything? Isn't food just food?

Mom: Why would they put it on there if it doesn't matter? I understand wanting to eat healthy, but this meal is going to cost me a fortune. Who knew a simple trip to the grocery store could be so complicated?

Initial Assessment

Define in your own words what each of the following food labels mean. You should not use the term in your definition. For example, to define the "No MSG" label, you should not simply say "it does not contain MSG," rather you should try to explain what MSG is and describe the purpose of the label. Also indicate how confident you are that you understand what this label means by circling one of the numbers in each box where 1 indicates "not at all confident" and 5 indicates "very confident."

Label	*My Definition*
Antibiotic Free	*Confidence level in my definition:* Not at all confident 1 2 3 4 5 Very confident
Cage Free / Free Range	*Confidence level in my definition:* Not at all confident 1 2 3 4 5 Very confident
Gluten Free	*Confidence level in my definition:* Not at all confident 1 2 3 4 5 Very confident
No Added Hormones	*Confidence level in my definition:* Not at all confident 1 2 3 4 5 Very confident
No MSG	*Confidence level in my definition:* Not at all confident 1 2 3 4 5 Very confident
Non-GMO	*Confidence level in my definition:* Not at all confident 1 2 3 4 5 Very confident
Organic	*Confidence level in my definition:* Not at all confident 1 2 3 4 5 Very confident
Probiotic	*Confidence level in my definition:* Not at all confident 1 2 3 4 5 Very confident

On the scale below, rank each of the labels from above by placing each term at one of the vertical lines to indicate how important you think each label is when making decisions about the food you purchase. (Assign one term per line.)

antibiotic free, cage free/free range, gluten free, no added hormones, no MSG, non-GMO, organic, probiotic

Question

What criteria did you use to determine whether something is more or less important to you?

Research Assignment

You are to write a research paper and create an infographic for a presentation on an assigned food label. Your paper should include an introduction that defines the label and how it is regulated, followed by paragraphs that address your assigned research statements below using evidence from multiple sources from your research (both the recommended resources included below and the ones you discover), and how you weighed evidence from different resources that may have opposing information. The report should conclude with a summary of the main take-home points of the research and your group's decision as to whether or not this label is important to consider when purchasing food, along with your reasoning.

Statements

Use evidence from your research to either support or refute the following statements about your specific topic. Be sure that your paper and presentation provide a clear and concise line of evidence as to why the statements are true or false.

You and your group members will also need to come to a consensus on whether or not you think it is worth it to buy products with these labels and why (use evidence from your research). You must share this viewpoint with the class at the end of your presentation!

Antibiotic Free

- If an animal is raised on antibiotics, then a consumer will ingest the antibiotics in the food products.
- Antibiotics are only used on animals when they are sick.
- Antibiotic use in animals can create "superbugs" that are resistant to antibiotics.
- Antibiotic use in animals is more economically friendly for the farmers.
- If farmers raise antibiotic-free animals and the animal gets sick they have to kill the animal instead of treating them with antibiotics.

Cage Free/Free Range

- Cage-free chickens are still confined to small spaces.
- Free-range chickens often are given plenty of land to freely roam and carry out their normal behaviors.
- Free-range and cage-free eggs are not healthier for the consumer.
- Chickens raised cage free and free range have a better quality of life then do the caged chickens.
- "Cage free" and "free range" mean the same thing when it comes to raising chickens.

Gluten Free

- Those with gluten sensitivity do not have a serious reason to be gluten free when compared to those with celiac disease.
- Gluten can only be found in wheat products.
- If you avoid gluten, even without having a doctor's recommendation, then you will be healthier.
- Consuming even small amounts of gluten can have an adverse effect on human health.
- Gluten free diets are restrictive and tend to focus on over-processed foods.

No Added Hormones

- Hormones can be present in food products even when they were not added to the animals directly.
- The hormone rBGH causes breast and prostatic cancer.
- Hormones can be used in poultry, such as chickens and turkeys, to help them reach maturity faster.
- Hormones in animal products can cause early puberty in girls that consume them.
- There is an insignificant amount of hormones consumed by humans when eating or drinking products induced with hormones.

No MSG

- MSG is both an additive and naturally found in foods.
- There is no difference between MSG made in a lab and MSG found naturally in foods.
- MSG causes a condition known as "Chinese restaurant syndrome."
- MSG negatively affects the health of those who consume it.

Non-GMO

- Using genetic engineering to insert foreign DNA into the organism in a lab is the only way that humans have genetically modified plants for food production.
- Overall GMOs have a severe negative impact on the environment.
- GMO foods can help address hunger and food insecurity issues around the world.
- GMOs are economically beneficial for both consumers and farmers.
- GMO foods are as safe and nutritious as non-GMO foods.
- The use of GMOs increases the use of harmful pesticides/herbicides and can lead to the production of superweeds.

Organic

- Organic produce is grown without the use of any pesticides.
- Organic produce has never been proven to be more beneficial to your health when compared to conventional produce.
- Organic produce is more expensive to grow for farmers, and more expensive for consumers.
- There is a large difference between the labels 100% organic, organic, and made with organic ingredients.
- Organic food does not contain genetically modified organisms (GMOs).

Probiotic

- When the good bacteria in your body have been disrupted, such as by taking antibiotics or undergoing surgery, taking probiotics can help replenish these good bacteria.
- There are strict regulations on the type and amount of bacteria present in probiotics.
- Probiotics can be found in products beyond just dairy products.
- Probiotics can prevent cancer and depression.
- Everyone should be on a probiotic regimen to ensure a healthy and balanced diet.

Provided Resources

Antibiotic Free

- https://www.consumerreports.org/overuse-of-antibiotics/what-no-antibiotic-claims-really-mean/
- https://www.vox.com/future-perfect/2023/1/8/23542789/big-meat-antibiotics-resistance-fda

Cage Free/Free Range

- http://www.agdaily.com/livestock/poultry/farm-babe-look-at-hen-houses-and-the-egg-production-system/
- https://animalequality.org/blog/2022/05/11/9-images-that-portray-the-cruelty-of-the-egg-industry/

Gluten Free

- http://www.mayoclinic.org/healthy-lifestyle/nutrition-and-healthy-eating/in-depth/gluten-free-diet/art-20048530
- https://www.forbes.com/health/nutrition/diet/gluten-free-diets/

No Added Hormones

- http://www.businessinsider.com/no-added-hormones-chicken-pork-usda-fda-regulations-2016-3
- https://noharm.org/sites/default/files/lib/downloads/food/HCWH_Position_on_rBGH.pdf
- https://www.cancer.org/cancer/risk-prevention/chemicals/recombinant-bovine-growth-hormone.html

No MSG

- https://www.jacionline.org/article/S0091-6749(00)44233-8/pdf
- http://www.sciencefriday.com/articles/is-msg-bad-for-your-health/
- https://getyourleanon.com/nutrition/msg-the-silent-killer-in-our-cabinets/

Non-GMO

- https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2408621/
- http://www.livescience.com/40895-gmo-facts.html
- http://www.nongmoproject.org/gmo-facts/

Organic

- http://www.mayoclinic.org/healthy-lifestyle/nutrition-and-healthy-eating/in-depth/organic-food/art-20043880?pg=1
- https://www.realbuzz.com/articles-interests/nutrition/article/the-pros-and-cons-of-organic-food
- https://www.pubs.ext.vt.edu/ENTO/ENTO-384/ENTO-384.html

Probiotic

- https://www.nccih.nih.gov/health/probiotics-what-you-need-to-know
- https://draxe.com/nutrition/probiotics-benefits-foods-supplements/

Internet resources accessible as of April 23, 2024

Post-Case Assessment

Define in your own words what each of the following food labels mean. You should not use the term in your definition. For example, to define the "No MSG" label, you should not simply say "it does not contain MSG," rather you should try to explain what MSG is and describe the purpose of the label. Also indicate how confident you are that you understand what this label means by circling one of the numbers in each box where 1 indicates "not at all confident" and 5 indicates "very confident."

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What criteria did you use to determine whether something is more or less important to you? How does this compare to your initial criteria? (Refer to your Initial Assessment.)

How might you use what you learned in this case study to inform your future consumer decision making?

How has this case study impacted your ability to find and evaluate sources for valid information related to a scientific topic?