Title: PSU Take-Home Training for Professional Standards: Produce Quality and Condition
Credit: 1 Hour
Codes: 2400, 2410, 2600, 2620
Edition: 2017

Materials Needed:
Strawberry Fact Sheet; handouts for participants
http://www.nfsmi.org/documentlibraryfiles/PDF/20110822025159.pdf
Orange fact Sheet; handouts for participants
http://www.nfsmi.org/documentlibraryfiles/PDF/20110822025009.pdf

Produce Quality and Condition Presenter Notes:

Slide 1:
Cover slide

Note to instructor: Welcome participants to this training session.

Slide 2:

Note to instructor: Review the learning objectives with the participants.

Slide 3:
The Agricultural Marketing Service (AMS) develops descriptions for fresh produce quality and condition called U.S. Grade Standards. This uniform language is used to describe measurable quality and condition defects or absence of defects, such as shape, color, decay, bruising, etc. Grade standards help the buyer and the seller. The buyer knows what he/she is getting for the money. The seller doesn’t have to worry about produce being returned and having unhappy customers. Plus, the seller can demand a higher price for better quality produce.

U.S. Grade Standards are updated if the industry requests a change due to market demand. For example, in 2010 the industry requested a change to fresh potatoes to allow different varieties to be sold in a box labeled mixed.
Slide 4:

Without industry requests for changes, grade standards could stay the same for many years. One of the oldest fruit grades is for blackberries, which has not been updated since 1928.

When you receive U.S. No. 1 blackberries, they should be firm, blue or black in color (well colored), not misshapen, not soft, and without caps (also called calyces). Not more than 10 percent of the blackberries in the lot can fail these requirements. If they do, they cannot be labeled U.S. No. 1 blackberries. Not more than 5 percent may have serious damage: berries that are badly deformed, crushed, leaky, moldy, or decayed. Finally, mold or decay is very detrimental to the grade standard because the product is virtually unusable. Not more than 1 percent of the lot can show signs of mold or decay.


Slide 5:

Your specifications may include grades, so you need to understand what the grades mean in order to write good specifications to get the product you desire. Use the specification and grade to train receiving staff on what to look for during the delivery. You do not have to be a produce inspector, but you do need to know how grade standards relate to your job at the back door in your school or central kitchen.

Think about this question—you know you are supposed to get extra fancy apples because it is on the specification. You received a box from your distributor that says “Extra Fancy.” How do you really know that you received extra fancy apples?

Slide 6:

When an inspector assigns a grade, he or she evaluates the produce based on certain types of defects. The inspector deducts points from the “perfect score” for defects, depending on how many of the produce items in the case or lot have that defect and how big the defects are that affect the case. We aren’t going to talk about grading, but we are going to talk about the defects, because they should be visible when you open boxes and look through your produce delivery at the point of receiving.

There are two main types of defects—quality defects and condition defects. Quality defects occur during the growing process or as the product was being packed, but do not get worse with time. Condition defects worsen over time and occur during picking, packing, and shipping, or after the growing process.
We are going to review examples of quality defects first and then we will review examples of condition defects. As we go through the examples, we will examine how these defects affect the produce purchased for your programs, including the impact on product safety.

**Slide 7:**

Produce shape may be altered because it is grown outside in uncertain conditions. It is difficult to control Mother Nature and her armies of insects, excess sun, rain, etc. Quality defects do not get worse over time. This cucumber will not get any more crooked, nor will it suddenly become straight.

Are you ever going to see a cucumber that crooked in a case that you get from your distributor? The farmer, the processor, or the distributor sorts products during grading and packing. For example, all the crooked cucumbers might be separated out from the cucumbers that make the highest grades. They might all get sold at a much lower price to someone who can use them even though they are crooked, maybe to a company that makes vegetable juice or who will run them all through a machine to chop or dice them.

**Ask:**

Could you possibly get a cucumber that looks like this from your local farmer? Would you still be able to use that cucumber?

*Note to instructor: Allow for 1-2 minutes of discussion on these questions.*

**Ask:**

What if you don’t want to get crooked cucumbers? How could you make sure these are not delivered to you?

*Note to instructor: Allow for 1-2 minutes of discussion on these questions.*

**Tell:**

You should ask for straight cucumbers in your bid specifications, or choose a grade that does not allow crooked cucumbers in the case.

Quality defects related to shape do not affect safety or taste. When your specifications state the apple must meet U.S. No. 1 requirements, the apple in the picture on this slide does not make the grade. It will taste exactly the same as a U.S. Extra Fancy apple. However, it may not fit through your fruit sectioning equipment. If you are planning to make applesauce, it may be acceptable.

**Slide 8:**
Our next quality defect is texture. Again, taste is probably not affected, just marketability. But, if you are going to make lemonade, you may not care whether the texture of this lemon is perfect or not. Intended use should drive what you purchase. You don’t always need to buy the best or most perfect product. You can, but if you do, you will have to pay more. Texture defects do not impact safety.

**Slide 9:**

The next quality defect is scarring. This scar did not happen in the box; it happened in the field. When immature fruits or vegetables are injured, or the skin or rind gets a scrape on it, the fruit or vegetable will try to heal itself. Just like when you get a scrape, your body may scar during the healing process. The scars will not get bigger.

**Ask:**

Does the scar matter to you? Will a student choose this *(point to screen)* apple on the lunch line? What if you are peeling all of the apples anyway? What if you are going to slice the apple? Will the scar be as noticeable on the serving line?

*Note to instructor: Allow for 1-2 minutes of discussion on these questions.*

These are the questions you should ask yourself when writing specifications. Produce of a higher grade will not have excessive scarring—you may get an apple with a scar once in a while, but certainly not on every apple. But, again, you pay more to get apples without scars.

Generally, scars do not present a safety risk. If a scar penetrates the skin/rind it would then become a skin break or cut, which would be evaluated differently.

**Slide 10:**

Color is also a quality defect if the produce does not have the color considered to be characteristic of that particular product. The color requirement depends on the variety and the grade. Color defects do not affect product safety.

Strawberries must have three-fourths or more of the surface area a pink or red color to be considered a high grade. That means there might be a lot of white color (25%) on your U.S. No. 1 strawberries. Is that okay with you? What if you want your strawberries to be all red? Could you write that in your specifications? Keep in mind that anytime you ask your supplier to sort or pack your produce in a specific way, you will pay more.

Lower grade strawberries may have more white color on the surface. If you specify a lower grade strawberry, such as U.S. No. 2, you may receive strawberries that are mostly white or are misshapen. However, a U.S. No. 2 strawberry may be completely acceptable to use if you
are slicing and placing them in fresh fruit cups.

These grapes are supposed to be red grapes. They would be considered poorly colored and not U.S. No. 1 by inspectors. However, would you still eat them? They may have a great taste and could be served with fresh red apple slices for contrasting color.

Both of these apples are probably acceptable in your school meals program. The well-colored red apple in this photo may grade higher and cost more just because it is considered to be “more red” according to the grade standards. Again, the intended use is key when you consider appearance and quality defects.

Slide 11:

Growth cracks are the last quality defect that we will talk about today. These are healed over cracks that occurred during the growing process. For example, this potato might have grown next to a rock or vine or maybe grew too fast, and somehow an injury occurred. Just like your body heals, plants heal, too, after they are injured. As the produce continues to grow, cracks may form during the healing process.

Microorganisms transferred to fresh produce can enter areas of pre-existing damage. Cracks may also lead to rot or splitting, which may impact safety. We will talk about the safety impacts of decay and internalization when we discuss condition defects.

Looking at these two vegetables, you probably would not serve either of these items in this form. If you wanted to cut these carrots into sticks, you might have to cut the defect off, and waste some of the carrot. But if you were going to chop the potato into pieces and roast them, then the crack and the removed scar might not be a problem.

To summarize quality defects, remember, the higher the grade, the better product quality will be based on appearance, not taste. There will be fewer defects in shape, texture, color, and scars that occurred during the growing process with higher grade products.

Note: Quality defects – The larger the blemish, or lack of color, the lower the grade assigned.

Slide 12:

Before we talk about condition defects, I want to point out that Many times size is also a part of Grade Standards. For example, a U.S. No.1., Potato has a minimum of 1-7/8\textsuperscript{th} inches in diameter. This minimum can also be designated by the customer to be larger or smaller in diameter or weight. When ordering, size can be designated, but it may affect the price. Larger potatoes are generally more expensive, except for the specialty sizes such as B’s or C’s, which have a minimum and maximum diameter.

Size in conjunction with Grade

U.S. No.1., 100 size must meet - not less than 6 or more than 10 ounces in weight.
Slide 13:

Now we are going to talk about condition defects. The first example of a condition defect is bruising.

A farmer has to pick the product, put it in a container, process it, and put it on a truck, airplane, or train to get to you. Through these steps, the product may get bumped, banged, or dropped and bruised.

Condition defects may get progressively worse over time—either between the point at which it is graded and when the produce gets to you, or after the produce gets to you and is stored in the refrigerator. Remember, quality defects will not get worse over time, but condition defects will. Bruises may get softer or bigger over time, or may change the taste or texture of the product.

Bruised spots present ideal conditions for microbial growth and, therefore, can present a food safety risk. Bruises can serve as an entryway for surface microorganisms. Once microorganisms (including pathogens) are internalized they cannot be removed and microbes will thrive in the nutrients provided by the flesh of the produce.

Current FDA food safety guidance for consumers is to cut away damaged or bruised areas before preparing/eating, but cutting out and throwing away the bruised produce will cost you more money because you will need to purchase more product to reach your desired yield.

Slide 14:

The second example of a condition defect is called “sunken discolored areas” or SDAs. This is a general term that describes any areas that look sunken and discolored for any reason. Injuries to the produce resulting in moisture loss can cause the damaged area to become depressed. We may not always know the cause of sunken discolored areas, but they are considered condition defects that may affect the grade of the product.

They may also become bigger, more sunken, or more discolored over time. You will probably have to cut these out or discard the product if the defect is too large. Again, this will cost you money.

Like bruises, SDAs may present a food safety risk. The damaged area may break down the plant’s natural defenses – the skin or rind - and serve as an entry point for pathogens.

Slide 15:

Shrivel ing is our third condition defect. Produce contains a lot of water—for example, watermelon is 95% water. As produce gets older, it loses moisture and it starts to shrivel.
One reason produce might shrivel is due to temperature fluctuations. If you have ever taken plums out of the refrigerator to ripen and then placed them back in the refrigerator, they shrivel up. Maintaining the cold chain helps to prevent dehydration and shriveling.

You may be tempted to soak produce in water or ice water to “crisp” it. This practice is not recommended because certain fruits and vegetables are susceptible to infiltration of surface microorganisms during soaking or submersion. This is especially true of tomatoes.

**Slide 16:**

This condition defect is called surface discoloration. Has anybody ever seen an eggplant like this one? What would happen if you stored it for a few days and then decided to use it? The brown spots will be bigger. It may even be brown inside and soft. It will definitely deteriorate more quickly than an eggplant without surface discoloration.

Discoloration may indicate that spoilage is soon to follow or that the product has been damaged. If this is the case, then there is potential that microbes could thrive in these areas and gain entrance to the produce where they’ll have access to nutrients.

Unfortunately some surface discoloration only shows up after shipping. What would you do if you got a case of apples and several looked like this one? Again, if the produce does not meet your standards, talk to your vendor. Remember, you can get produce with little or no defects, but it may cost you a bit more money.

**Slide 17:**

The last condition defect that we are going to discuss is decay. No matter how large or small the area of decay, it will be scored decayed and the grade will be affected.

Decay worsens rapidly. Decay may happen in storage and transit. You may open a case of produce and find decay. If there are two to three pieces of fruit with evidence of decay in the case, you are probably not going to want to refuse everything. However, do remove the decayed fruits or vegetables immediately because decay spreads. It is realistic to expect some decay. Every U.S. grade standard, even the highest grades, have a very small tolerance for decay (usually 1-2 percent). However if one third of the box is decayed, or even 5 percent (or whatever number you decide in your specification), then you should not accept the product and call the distributor.

From a food safety perspective, a decayed spot is similar to a bruise and can serve as an entry point for microbes. Microbes can also thrive in the decaying areas. Current FDA food safety guidance for consumers is to discard produce that looks rotten. If the product is severely decayed, throw it away.
Now that you know about grading standards, talk to your distributors about the quality and condition you expect of the produce they deliver. Include this information in your specifications. Document poor quality and condition of produce on vendor complaint forms and reject poor quality and condition produce that does not meet your specifications.

**Slide 18:**

Why do you think it is important to know and understand the major quality and condition factors of fresh produce?

It is important to recognize that some defects can impact the safety of fruits and vegetables. The safety of the food you serve should be your primary concern.

USDA produce grade standards are based on the quality and condition defects we have just discussed. Typically, the higher the quality and better condition of the fruit or vegetable the higher the price you will pay. School district buyers should include specific grades in bid documents for each produce item purchased. Consider how the product will be used in your school meals program. It is possible that a lower grade would be suitable and well accepted by your students. If you write your specifications wisely, then you will save money, possibly purchase more fresh fruits and vegetables, and get a safe and high quality product for your students.

**Slide 19:**

Finally, to ensure that you receive what you ordered, train your staff to know what the produce should look like based on the specifications. Site-based staff members are the eyes and ears of a good procurement system. Your staff must have access to the written specifications. If your specifications only state the specific grade standard, you should consider providing written descriptions. Pictures and demonstrations may also be helpful during training.

You may be surprised at how much your produce quality improves when you start inspecting and rejecting product that does not meet your specifications.

*Note to instructor: Briefly explain the process for documenting and rejecting unacceptable produce in your school district(s).*

**Slide 20:**

**Activity**

We are now going to view of video of Tom from the Agricultural Marketing Service explaining quality and condition factors for strawberries and oranges. He will talk about the factors that
are used in scoring and tell us what an ideal orange and strawberry might look like to receive the highest grade. As we watch the video, pay attention to the types of defects that Tom mentions.

**Slide 21:**

*Note to instructor:* Hand out Strawberry fact sheet and orange fact sheet. Play video. After the video has finished,

**Ask:**

What types of defects did you hear discussed in this video?

Did you learn anything new about oranges or strawberries?

*Note to instructor: Allow for up to 5 minutes of discussion on these questions.*