

Sensory Acceptability of Puréed Foods¹

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Sensory evaluation—What is it?

Sensory evaluation is the process of using our senses (taste, smell, touch, sight) and applying them to determine the acceptability of foods. Simply, it is assessing the food to make sure that it looks, smells, and tastes delicious!

Why evaluate the acceptability of puréed foods?

It is important that we enjoy the foods we eat. This makes for a better quality of life. This is no different for those people needing to be on a puréed diet due to swallowing problems. Taste and aroma are even more important with puréed foods because of the changes in texture and appearance.

All puréed foods should be evaluated before serving, new recipes in particular. Just as you would not want to serve guests a recipe without trying it first, you do not want to serve puréed food without knowing that it is appealing.

Evaluating Puréed Foods

For best results, test new recipes by having those who are consuming the foods evaluate them so that changes can be made as needed. An easy way to do this is to have a discussion group. Present a new purée, and then have the group rate it and provide feedback.

A rating scale that can be used is a 5-point scale where 1 = extremely dislike, 3 = neither like nor dislike, and 5 = extremely like. Using the images makes it even simpler (Figure 1).

Questions to ask using this scale:

- How do you rate the taste?
- How do you rate the aroma?
- How do you rate the appearance?
- How do you rate the texture?

Rating scales allow you to compare between foods and between individuals.

Between Foods: For example, a recipe for puréed broccoli may get an average rating of 3 out of 5, whereas one for carrots is rated 4 out of 5. This suggests that the broccoli recipe may need to be adjusted to improve its flavor. Alternatively, it is possible that carrots are simply well-liked and broccoli less so. You will need to consider what average rating would be considered unacceptable.

Between Individuals: For example, a group of taste-testers ranks puréed peaches an average of 5 out of 5, but one person ranks them as 1 out of 5. You may want to determine if he or she simply does not like peaches, or perhaps misunderstood the ranking scale. Despite the one low ranking, this recipe should be offered because most of the group ranked it highly.

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Below is a sensory scale from which you can make copies to evaluate your purées.

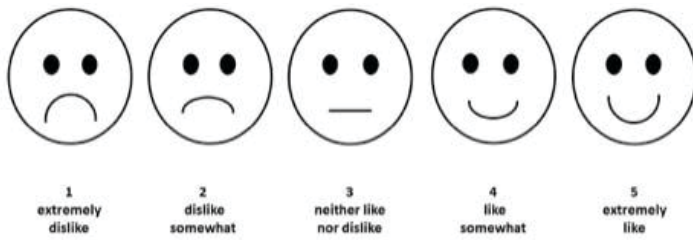


Figure 1. Rating scale with five distinct degrees of satisfaction illustrated by easily recognizable facial expressions ranging from classic frowny face (extremely dislike) to smiley face (extremely like).

Tips for Improving the Acceptability of Puréed Foods Taste

The taste of puréed foods needs to be more intense than for regular texture foods. This is because the act of chewing a food releases flavors in the mouth. Once a food is puréed, it does not require chewing. It can be simply swallowed without much time for the flavor of the food to be tasted. Increasing the flavor of puréed foods helps with flavor recognition.

There are several ways to achieve stronger and improved flavors:

- **Flavor enhancers** are food ingredients that can be used to increase the natural flavor of a food item. They increase flavor intensity. These are special ingredients that can be purchased. Older adults have been shown to have decreased sensation of taste and smell (Bhattacharyya and Kepnes 2015). Flavor enhancers have been shown to improve the food intake of older adults (Mathey et al. 2001). Examples of flavor enhancers include (US FDA 2002):

- Calcium Glutamate
- Disodium 5'-inosinate
- Ethyl maltol
- Glycine
- L-Glutamic acid
- L-Leucine
- Magnesium Glutamate
- Maltol
- Monosodium Glutamate (MSG)
- Thaumatin

- When preparing puréed foods, try using flavorful liquids instead of water. For instance, use broth or gravy in puréed meats, and fruit juice or dairy products in desserts.
- Spices and ground herbs can also be added to puréed foods to add variety and increase acceptability. However, these alter the natural flavors of food and may make it harder to identify puréed foods.

Keep in mind that other factors can negatively impact flavor. These include refrigeration and freezing, microwaving, and reheating of foods (Ray 2016).

Storage and preparation can produce off-flavors, especially with foods containing fats such as meat, seafood, and dairy products (Ray 2016). While storage is often necessary for food preparation, there are a few things that can be done to maximize pleasant flavors while minimizing off-flavor.

- Whenever possible, prepare purées with the freshest ingredients possible and serve immediately. If you need to prepare items a day or two in advance, it may be better to freeze and thaw than to refrigerate.
- When refrigeration and storage are needed, limit the length of time food spends in storage. This is especially true for foods already prepared, such as purées. Keep the storage time of homemade purées as brief as possible. Some commercially prepared purées are designed to be frozen and may be stored longer.
- It may not be practical for you to create and serve purées immediately, so reheating is unavoidable. When reheating foods, it is best to prepare them using conventional methods (such as the stovetop or oven) that will produce the best quality purée.
- Avoid using the microwave to ensure the best quality in your purées. Heating and reheating in a microwave may lead to off-flavors, especially with meats and seafood. Restrict the use of a microwave to products that are specifically designed for microwave heating, such as frozen vegetables or dishes that have instructions for microwave use.

It is also important not to mix puréed foods together as the flavors may become unrecognizable. The inability to identify a food (e.g., is this chicken or pork?) has been associated with a negative meal-time experience for those on puréed diets (Blaise 2009). For example, it is better to present purées as individual items or layers instead of mixing them into one “casserole” type item. For example, puréed pasta, puréed meatballs, and tomato purée could be layered so that each flavor can be recognized. It is

important to remember that when texture is modified, reliance on taste for food recognition is heightened.

Aroma

Aroma is often the first sense we use during mealtimes. It is often the first thing we notice, even before the food is placed on the table. This is why it is so important to make sure the puréed foods have appetizing aromas! Just like with taste, it is best to limit the number of foods combined in a puréed food so that the food aroma is recognizable. Think about it. If you smell ham but eat a blended purée of ham, potatoes, and green beans, it will probably taste unpleasant because it is not what was expected. This is because aroma is inherently linked to taste.

When a food is heated, the aroma is released. Aromas are best preserved when foods are heated by conventional means (stovetop, oven). Although microwaves are well suited for reheating puréed foods, aroma may be altered. In addition, microwaves heat unevenly, which may alter the overall aroma profile of the food (Roberts 1997).

It is also possible to alter the aroma of food by the addition of an ingredient that produces a potent aroma. A food that is puréed may have its aroma enhanced by the addition of herbs, spices, and/or extracts (e.g., vanilla). Commercial aroma enhancers are available, the most common being monosodium glutamate (MSG) and 5'-inosine monophosphate (5'IMP) (Astray et al. 2007).

Texture

Acceptable texture is one of the most important features of puréed foods. There are several things to keep in mind when preparing a puréed food to a proper consistency.

Make sure puréed foods are smooth and cohesive. A purée should not require chewing and should be “spoon-thick.” It should not be too dry or too thin. Purées should not contain lumps.



Figure 2. “Spoon thick.”
Credits: UF/IFAS

Puréed foods should not be sticky. For example, mashed potatoes and other starchy puréed foods can often be thick and may stick to the roof of the mouth. Adding gravy or sour cream can reduce stickiness and produce a smoother, creamier texture. To decrease stickiness of starchy puréed food, use sauces, cream, or other fats appropriate for the item being prepared.

Puréed foods should not be too thin. Very thin purées are generally more difficult to serve and may be more difficult to swallow than spoon-thick purées for some individuals. A purée that is too thin is often the result of adding too much liquid during preparation. To achieve the appropriate spoon-thick texture, add liquid a little bit at a time.

When preparing puréed foods, you may need to use a thickener. While there are many commercial starch thickeners available (e.g., Thick-It®, Thickenup®), using foods to thicken purées produces a product that is more nutritious and generally more appetizing. Grains and other starchy foods work well for thickening purées. Some examples of food thickeners include:

- Powdered crackers/breadcrumbs
- Baby cereal
- Finely ground breakfast cereals
- Puréed chickpeas or navy beans
- Puréed bananas
- Puréed starchy vegetables (potato, peas)

Appearance

Appearance is just as important as the other food characteristics. We often “eat with our eyes” first. Color becomes more important with puréed food; because appearance is significantly altered by processing.

It has been shown that older adults rely more on visual cues to identify food products (Philipsen et al. 1995). Recognition of food items is an important part of the mealtime experience for older adults on purée diets (Blaise 2009). Because a puréed food no longer has its original form, there are a few ways to make it more recognizable and appealing.

Keep foods separate as much as possible. For instance, combining puréed carrots with puréed peas will produce an unattractive color. By keeping foods separate, food items retain their color and are more easily identified.

Consider using food molds for purées. These molds are designed to make the purée resemble the original whole

food item. The use of molds may or may not be preferred. Food molds can enhance appearance and improve intake for some individuals (Farrer et al. 2016). For others, a natural unmolded purée is preferred (Lepore et al. 2014). It is possible that the molded purée, when shaped like the original food, will lead to an expectation that the puréed food will have the same mouth feel as the original food. Make sure you ask the consumer if molded purées are preferred.



Figure 3. Meal of puréed food items, each molded separately to resemble the whole food item.

Credits: UF/IFAS

Adding puréed garnishes can enhance the appearance of purées as well. This is especially true if you are using scoops instead of food molds. Puréed garnishes include:

- Sauces/Gravies
- Condiments (ketchup, mustard, mayo, etc.)
- Sour Cream
- Whipped Cream
- Thick Syrups

Summary and Useful Links

When trying new recipes or using existing recipes for purées, make sure they appeal to all the senses. The purée should smell, taste, and look appetizing. It is also important that the texture be smooth and cohesive. The best way to evaluate whether your recipe entices with all these qualities is to do sensory testing! This can be done by the chef/cook, caregiver, and/or the person(s) with swallowing problems. Please see the attached form for your use when evaluating purées.

Listed here are useful publications for your reference:

- *Puréed Foods for Swallowing Problems*, <https://edis.ifas.ufl.edu/fs168>

- *Swallowing Problems and the Older Adult*, <https://edis.ifas.ufl.edu/fs164>

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Table 1. Food evaluation form

| Purée | Appearance | Aroma | Taste | Texture | Overall | Comments |
|-------|------------|-------|-------|---------|---------|----------|
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Scale:
1=extremely dislike / 2=dislike somewhat / 3=neither like nor dislike / 4=like somewhat / 5=extremely like