Introduction to texture-modified foods and beverages for dysphagia diets

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Goals of the unit

The aim of this lesson is to understand the need for the use of texture modified diets in dysphagia management and what are the requirements of texture-modified foods and beverages.

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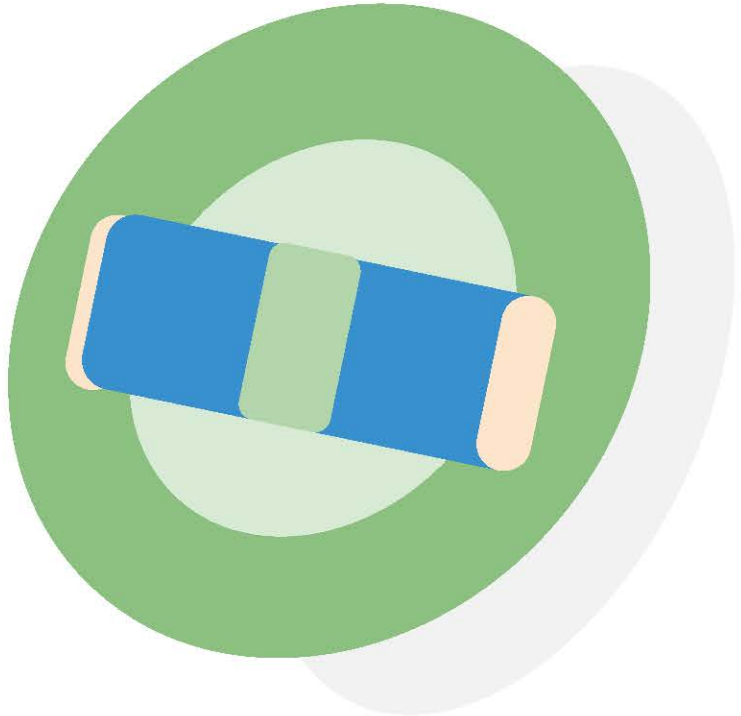
Learning outcomes

- To perceive the benefits of the modification of the texture of solids foods and the viscosity of beverages for dysphagia diets;
- To understand the desired rheological characteristics of dysphagia foods, how to achieve those properties and how to describe them;
- To discuss choice of food,ingredients and preparation methods (recommended and inappropriate).



Source:Unilever

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Ice Breaker

Write down all the textural terms coming into your mind which appear in ads and packages used to describe the textural characteristics of food

As you can see, food texture is a key attribute of foods and beverages

Source: Ingredion

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Food and beverages for dysphagia management

- Dysphagia-adapted foods and beverages are commonly used to treat individuals who require short or long-term dysphagia management.
- People diagnosed with dysphagia usually find safer and easier to swallow food and beverages with adapted consistency and smooth texture.
- A speech and language therapist or any other healthcare professional should determine the severity of dysphagia and the required level of modification for each person.
- Those professionals may also recommend the use of a special thickening agent that will help the person preparing the dish o beverage to get exactly the right consistency each time.
- Foods should preferentially exhibit safe eating characteristics (avoid choking or aspiration), provide adequate nutrition and also give sensory enjoyment (for example, having good taste).

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Food and beverages for dysphagia management (1) _ Safe eating

Adaptation of foods and beverages for dysphagia management is mainly focused on modifying their viscosity, particle size and textural characteristics in order to ensure the safety during consumption.

The foodstuffs recommended for dysphagia diets should be **soft, moist, elastic, smooth, and easy to swallow.**

For example, foods for head and neck cancer patients should be soft and moist; these may include such foods as soups, puddings, yogurts, jellies, apple sauces, custards, gelatins, smoothies, and soft cookies or baked goods in milk.

Sticky and adhesive textures as well as thin liquids should be avoided since these textures can cause food residue to accumulate in the oropharynx and may lead to aspiration after swallowing.

The beverages should have the **right consistency and viscosity.**

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Desired characteristics of dysphagia foods (2) _ Safe eating

The physical nature of a foodstuff must be assessed comprehensively not only in terms of its hardness or softness but also considering matters such as cohesiveness, adhesiveness and viscosity.

Cohesiveness

Food should be cohesive to compensate the difficulties in chewing or bolus formation. Foods that break up are more likely to be retained in the mouth or pharynx, resulting in aspiration.

Adhesiveness

Adhesiveness is defined as the work necessary to overcome the attractive forces between the surface of the food and that of other parts of the mouth which the food comes into contact with. Food very adhesive may be retained in the mouth or pharynx.

Viscosity

Fluids with the appropriate degree of viscosity should be used in dysphagia management. Foods that are too viscous, however, are not suitable as they may be retained in the mouth or pharynx.

Note: Review Unit 4.2. for more information about rheological properties in dysphagia oriented products

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Inappropriate foodstuffs for dysphagia condition (1)

The following foods are especially dangerous for patients with dysphagia:

(1) Foods that do not soften even when cooked

Ham, mushrooms, shellfish, etc. Even if cooked and finely chopped, they break up and do not hold together well in the mouth.

(2) Hard foods

Nuts, sesame, dried shrimps, etc. These ingredients themselves are hard and simply break up when chewed and are easily aspirated.

(3) Thin and flat foods

Foods that are shaped like thin sheets are prone to stick to the soft palate. Thin foods are also difficult to perceive in the mouth.

(4) Slippery foods

Pasta, peas, seafood, pulses

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Inappropriate foodstuffs for dysphagia condition (2)

(5) High-fiber foods

Bamboo shoots, root vegetables, green vegetables, fish dishes, pineapple and other foods that are high in fiber cannot easily be bitten into pieces, and are prone to remain in the mouth.

(6) Dry foods

Bread, steamed potatoes, hard-boiled eggs, and other foods with a low water content become more viscous and harder when mixed with saliva.

(7) Sour foods

Vinegar is inherently easy to choke on. Citrus fruits and other sour foods are also prone to cause choking.

(8) Foods consisting of small pieces that do not hold together well

Minced meat cooked to dryness does not hold together in the mouth and is easily retained in the pharynx.

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Inappropriate foodstuffs for dysphagia condition (3)

(9) Foods that melt or release liquid in mouth

Gelatin, some fruits (watermelon, melon, orange….), icecream…

(10) Foods with small seeds, skin or bones

Kiwi, strawberries, peas, fish with bones…

(11) Adhesive foodstuffs

Food that adheres to the palate such as honey, condensed milk, candies…

(12) Foods consisting of two phases or two different textural properties

Chunky soups, rice porridge, milk with cereals… may cause choking

(13) Thin liquids

Thin liquids may cause aspiration

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Desired characteristics of dysphagia foods (1) _ Grades, scales and need of standardization

As seen in previous slides, food texture and liquid consistency play important roles in the care of patients with dysphagia.

A general understanding of the parameters defining texture-modified food and beverages for dysphagia patients worldwide is mandatory to ensure safe eating.

However, and as it is shown in Tables 1&2, different grades and scales have been used in different countries during the last years for liquids and for solid foods.

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Grades, scales and need of standardization texture modified food

Table 1. Thickened drink names and number of levels by world region.

Region	Names (least to most modified)
Africa	Normal/regular, nectar, syrup, pudding, thick
Australia + New Zealand	Thin, mildly thick/level 150, moderately thick/level 400, extremely thick/level 900
Asia	Thin, slightly thick, mildly thick, medium thick, extra thick
Canada	Thin, nectar, honey, pudding
Europe	Normal, syrup/slightly thick, nectar, honey, pudding
Ireland	Regular/normal, Gr 1, Gr 2, Gr 3, Gr 4
Middle East	Thin, mildly thick, moderately thick, other thick
South America	Liquid, slightly thick, nectar, honey, pudding
United Kingdom	Normal, stage 1, syrup, custard, pudding/stage 3
United States of America	Thin, nectar, honey, pudding

Source: Cichero et al., (2017)[2]

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Grades, scales and need of standardization texture modified food

Table 2. Texture-modified food names and number of levels by world region

Region	Names (least to most modified)
Africa	Normal, Soft, chopped, puree/mashed, liquid/blender
Australia + New Zealand	Full/normal, soft, minced + moist, puree/smooth puree
Asia	Regular, soft, minced/shredded, congee/puree, liquidized/blenderized
Canada	Regular, soft, minced, puree
Europe	Normal, soft/tender/cut up, ground/puree, liquid
Ireland	Regular, soft, minced + moist, puree/smooth puree, liquidized
Middle East	Solid, soft, minced + mashed, other puree
South America	Solid, soft, mashed, thick puree, liquidized
United Kingdom	Normal, fork mashable/soft, pre-mashed/texture D, puree, thin puree
United States of America	Regular, advanced/stage 3, mechanical soft/chopped/stage 2, ground, puree/stage 1

Source: Cichero et al., (2017)[2]

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Desired characteristics of dysphagia foods (1) _ Safe eating

In consequence, there was a gap in communicating and collaborating among experts in food services and clinical staff, and a classification system for food viscosity and texture based on sound empirical evidence to help with dysphagia management was necessary.

To bridge this gap, in 2012, the International Dysphagia Diet Standardization Initiative (IDDSI) [1] was founded to provide a globally standardized terminology and definitions for TM food and liquids that are applicable to dysphagia individuals of all ages, in all care settings, and for all cultures.

Ensuring the correct texture of food and consistency of drink implies the use of common levels of modification and descriptors

(Source: https://www.iddsi.org)

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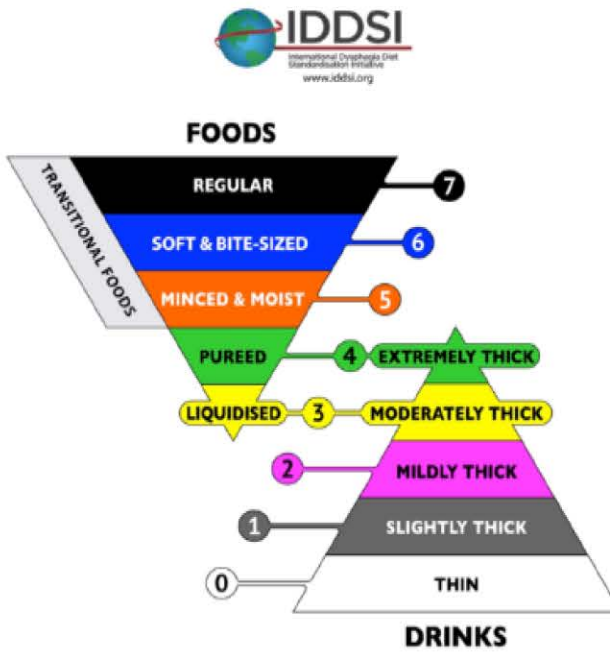
Desired characteristics of dysphagia foods (1) _ Safe eating

The International Dysphagia Diet Standarization Initiative (IDDSI) has been adopted by healthcare professionals all around the world.

The IDDSI Framework provides a common terminology to describe levels of **food texture** and **drink thickness**: 8 levels of modification were established in order to meet the different needs.

The 8 levels are defined by colour, number and name.

IDDSI provides a description of each level, along with instructions for easy, reliable and accessible methods to test different foods and drinks.



(Source: https://www.iddsi.org)

Review Units 4.2 and 4.3. for more information about IDDSI levels

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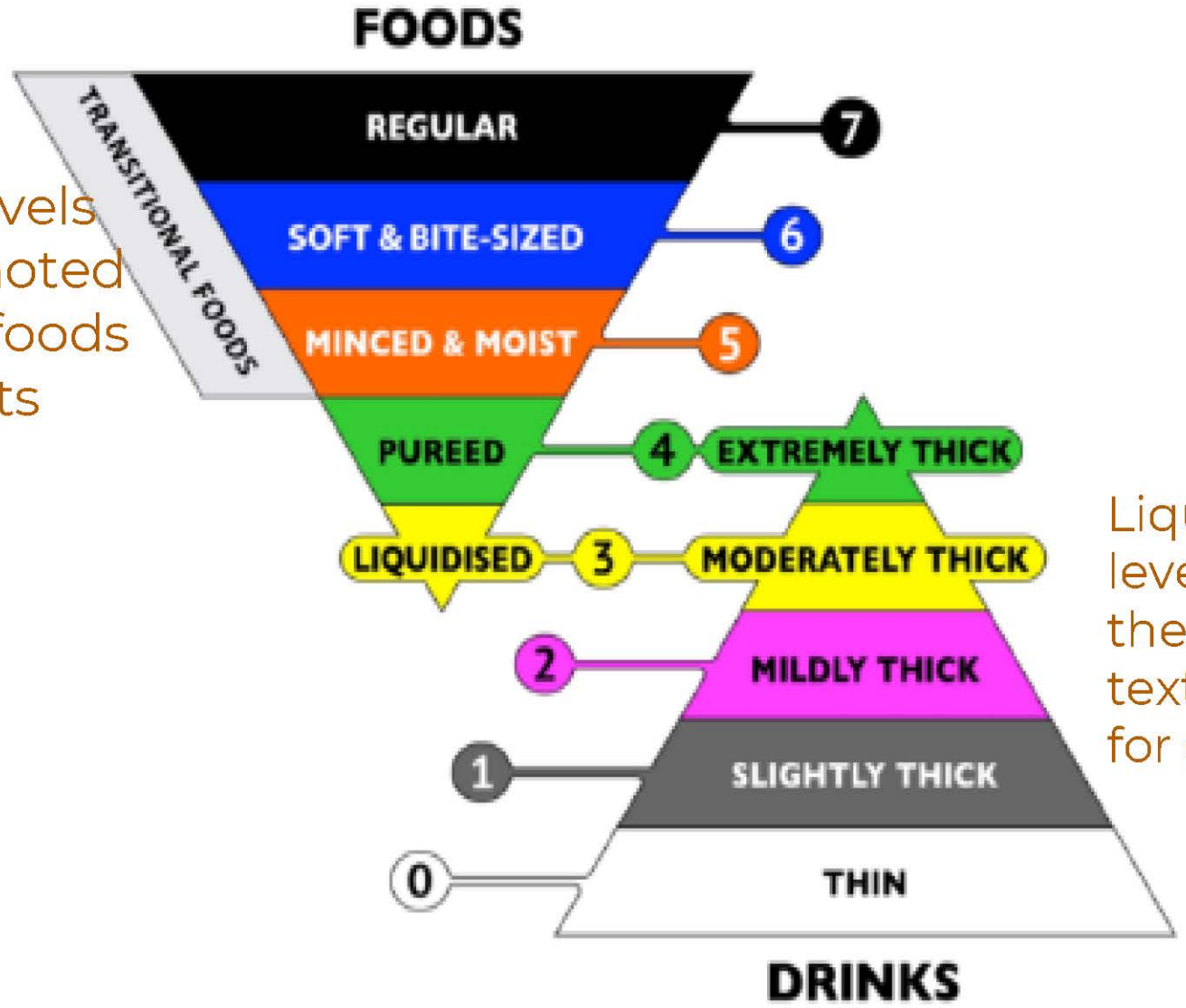
Foods classified as levels 4 to 7 are therefore noted as texture-modified foods for dysphagic patients



Liquids classified as levels 0 to 4 are therefore noted as texture-modified foods for dysphagic patients

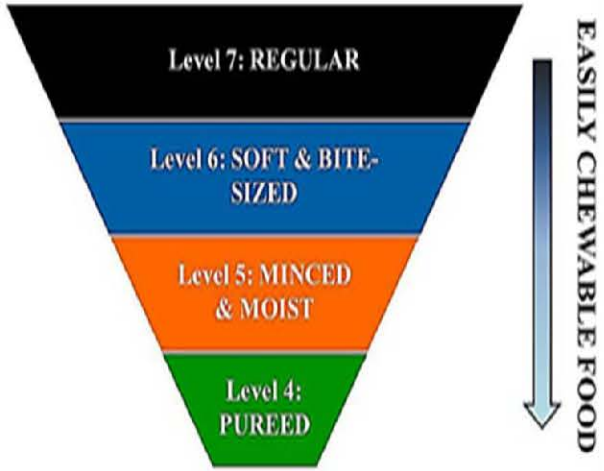
(Source: https://www.iddsi.org)

Descriptors and examples of IDDSI levels

Foods classified as levels 4 to 7 - Texture-modified foods for dysphagic patients

Level 7 is regular foods with various textures (for example, hard, crunchy, and naturally soft).

Level 6 (soft and bite-sized) foods can be mashed/broken down with pressure from fork, spoon, or chopsticks and are soft, tender, and moist throughout but with no separate thin liquid; chewing is required for this class of foods, which include cooked tender meat, cooked fish, and steamed or boiled vegetables.



(Source: https://www.iddsi.org)

Level 5 (minced and moist) represents soft and moist foods with no separate thin liquid; small lumps (of 2 to 4 mm in size) may be visible within the foods and minimal chewing is required. Level 5 foods include such items as minced meat and fish, mashed fruits, fully softened cereal, and rice (not sticky or glutinous).

Level 4 (pureed) does not require chewing, but is cohesive enough to hold its shape on a spoon; level 4 foods include such products as potato purée, carrot purée, and avocado purée.

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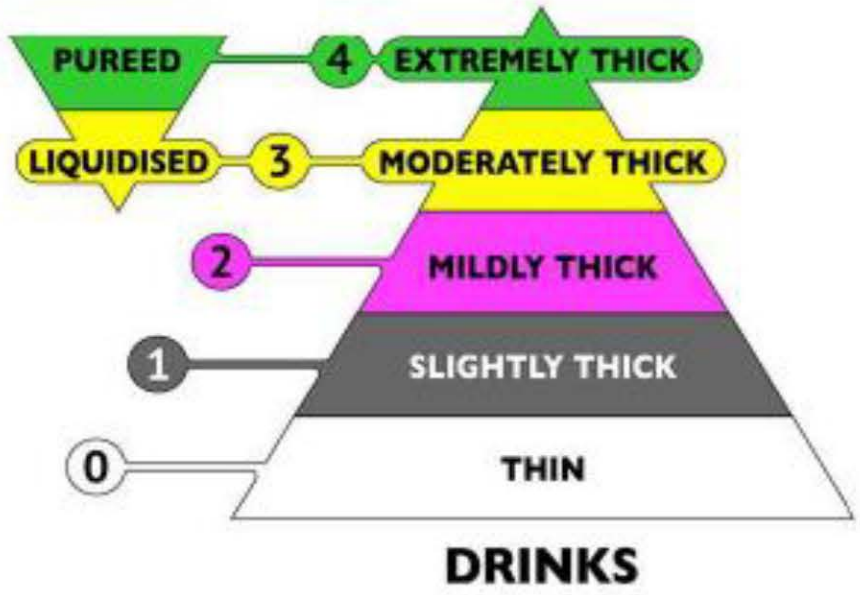
Descriptors and examples of IDDSI levels

Liquids classified as levels 0 to 4



Level 4 (extremely thick) shows some very slow movement under gravity but cannot be poured; Falls off spoon in a single spoonful when tilted and continues to hold shape on a plate; No lumps; Not sticky

Level 3 (moderately thick): smooth texture with no 'bits'; Moderate effort is required to suck through a standard bore.

Level 2 (mildly thick): flows off a spoon; Sippable, pours quickly from a spoon, but slower than thin drinks; Mild effort is required to drink this thickness through standard bore straw

Level 1 (slightly thick): thicker than water; Requires a little more effort to drink than thin liquids; Flows through a straw, syringe, teat/nipple; Similar to the thickness of most commercially available 'Anti-regurgitation' (AR) infant formulas

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Desired characteristics of dysphagia foods _ More than texture

Not only texture is important for dysphagia foods. Some other aspects should be considered.

Foods with a definite taste or aroma are preferable.

As water is added when foods are processed in a blender, and this may dilute their taste. The use of flavored sauces or other condiments may be advisable.

Foods should present an uniform density.

Chunky soups, rice porridge and other lumpy foods, or foods that contain a mixture of liquids and solids are not suitable, and caution is therefore required.

Temperature of foods also matters.

Foods should be either cold or hot. Items that are the same temperature as the skin are difficult to perceive when placed in the mouth, making it less likely that the swallowing reflex will occur.

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Desired characteristics of dysphagia foods _ More than texture

Foods should have a pleasant appearance and flavour.

The perception of characteristics considered attractive of the dishes through the 5 senses may result in increased salivation and facilitate swallowing in some cases.

It can also contribute to the improvement of cognitive and neurological aspects.

Source: Unilever Food Solutions

Review Units 4.5 and 4.6. for more information about presentation

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Texture Modified Foods

TEXTURE MODIFIED FOODS

Texture-modified foods is a term that refers to foods with soft textures and/or reduced particle size as well as thickened liquids (drinks) aimed at the population with eating dysfunctions.
Texture modified foods include foods which are softened by processing, minced, pureed or liquidized as well as liquids that have been thickened to various extents.

REQUIREMENTS

1. **Safety**
Their consumption should not cause health complications such as respiratory infections, choking or obstructions.

2. **Efficacy**
The body must be able to assimilate and use the nutrients ingested through the diet.

3. **Nutritious**
The diet must provide the type and amount of macronutrients and micronutrients adequate and necessary to maintain or recover an optimal state of health.

4. **Organoleptically adequate**
The characteristics of color, flavor, smell and temperature should be as similar as possible to those that would present the real elaborations, which allows to facilitate their identification and enjoyment.

5. **Attractive presentation**
The quantity, shape and decoration of the elaborations should be as similar as possible to that of the original recipe and should be done in the most attractive and careful way possible in order to attract attention and increase the appetite.

HOW TO DEVELOP AND SERVE TEXTURE MODIFIED FOOD

Diet planning
Choosing the ingredients
Food handling and preparation
Serving

→

Cleaning and washing
Handling
Culinary treatment
Texture modification (Size reduction / Use of thickeners)
Plating

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HOW TO IMPLEMENT TEXTURE-MODIFIED DIETS WITH SUCCESS IN A INSTITUTION

- BUILDING AWARENESS ABOUT DYSPHAGIA;
- CREATING A TEAM;
- TRAINING ON IDDSI LEVELS AND METHODS;
- CHOOSE OF LEVELS OF INTEREST;
- ASSESS PROCESSES AND PROTOCOLS TO CHANGE;
- APPROVE CHANGES;
- CLEAR PROCEDURES AND COMMUNICATION;
- TRAINING CLINICIANS AND STAFF.

Dining hall in a healthcare institution.
Source: Aspace Huesca -Heraldo de Aragón. Autor: Rafael Govantes

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To Know More

1. Cichero et al. (2017). Development of International Terminology and Definitions for Texture-Modified Foods and Thickened Fluids Used in Dysphagia Management: The IDDSI Framework. Dysphagia 32(2): 293–314. doi: 10.1007/s00455-016-9758-y

1. International Dysphagia Diet Standarization Initiative. https://www.iddsi.org/

1. Aguilera and Park (2016). Texture-modified foods for the elderly: Status, technology and opportunities. Trends in Food Science & Technology 57 (2016) 156-164. http://dx.doi.org/10.1016/j.tifs.2016.10.001

1. Park, H. S., Kim, D. K., Lee, S. Y., & Park, K. H. (2017). The effect of aging on mastication and swallowing parameters according to the hardness change of solid food. Journal of Texture Studies, 48, 362– 369.

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Table for activity

- The activity take 30 minutes
- Goals of the activity – to apply texture-modified foods preparation technologies
- Theoretical lecture and practical activity
- We need food products and equipment
- Online or live

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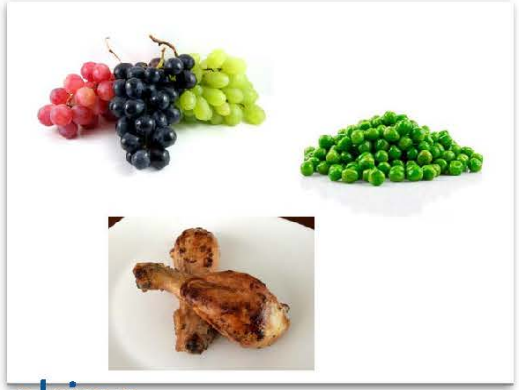
Activity:
Link each image with the type of swallowing difficulty

(1) Melting foods
(2) Tough foods
(3) Slippery foods
(4) High-fiber foods
(5) Two phases
(6) Adhesive foods
(7) Dry foods
(8) Foods wih seeds, skins....



Time for discussion

Any questions?

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Review

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Reflect on the session

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Feedback

How many stars would you give this workshop (1 to 5)?

What reasonable change would you recommend?

What did you like the MOST?

What did you like the LEAST?

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Indeed partners

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