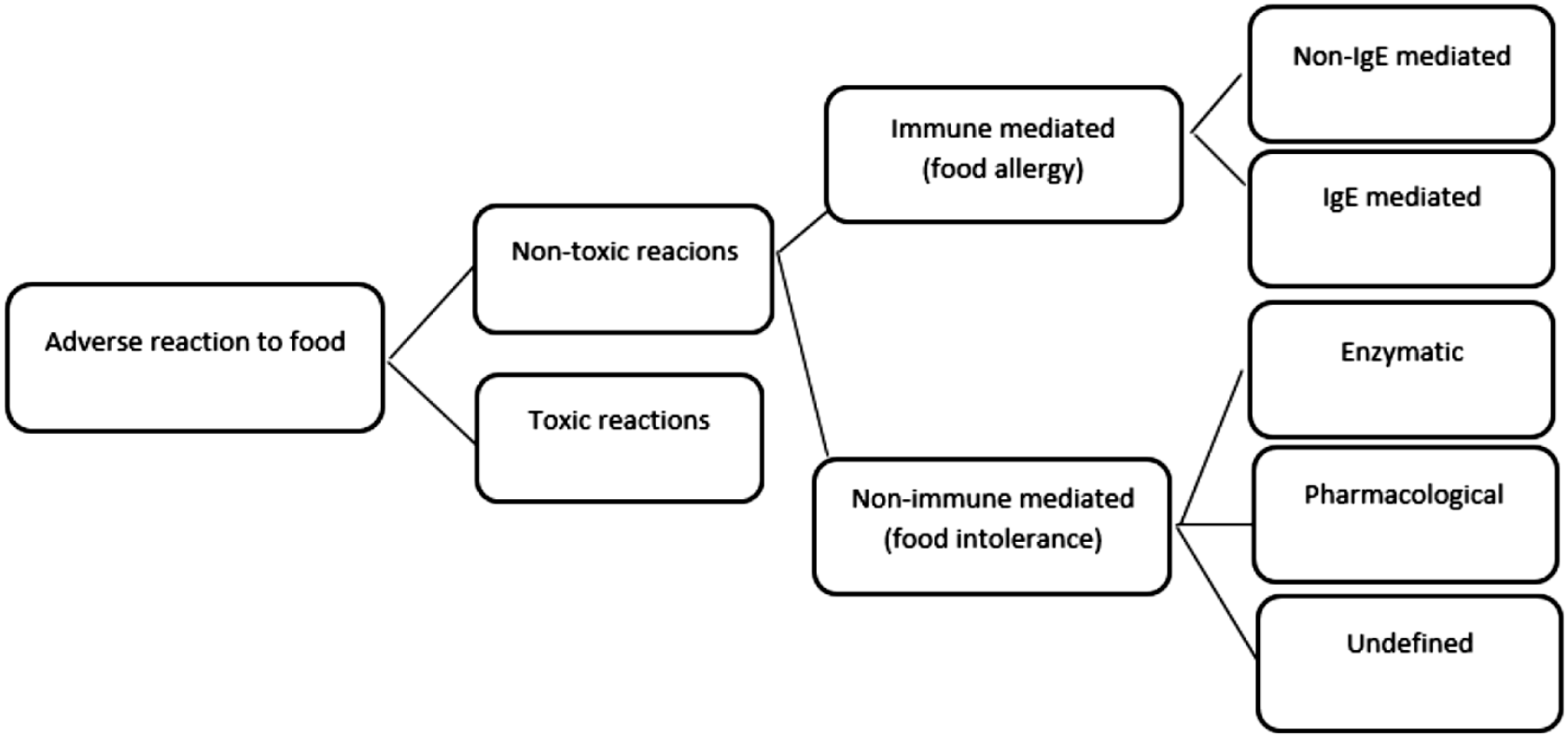
The adverse reaction to foods

U11

Adverse reactions to food, classification according to EAACI (European Academy of Allergy and Clinical Immunology)



Food allergy IgE mediated

U11

Food allergies are hypersensitivity reactions to commonly consumed foods.
Depend on an immune reaction mediated by IgE antibodies, it presents a clinical symptomatology that varies from mild skin reactions to anaphylactic shock.

Fonte: Modif. da: Evangelisti F, Restani P. *Prodotti dietetici. Chimica Tecnologia ed Impiego*. Seconda ed. Piccin Ed. 2011.

Risk factors are:

- Familiarity the symptomatology can change from parents to children allergy can develop towards different antigens
- Environmental factors exacerbated by exposure to more allergens (smoke, smog etc) too much hygiene in the neonatal age
- Gastrointestinal permeability
- Repeated exposure to antigen (GALT) Gut Associated Lymphoid Tissue

Food allergy IgE mediated

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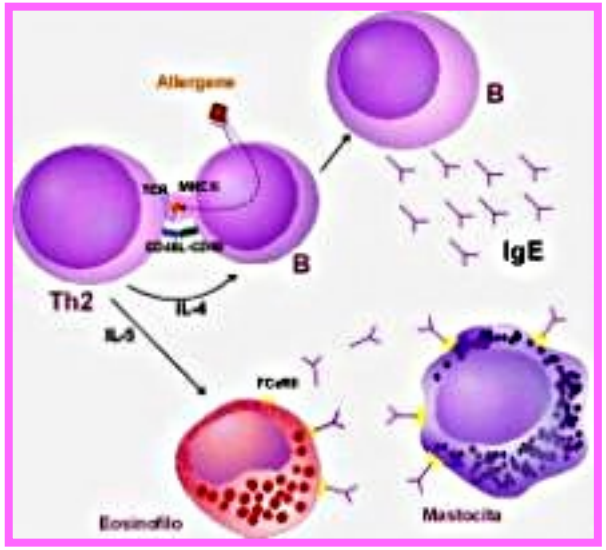
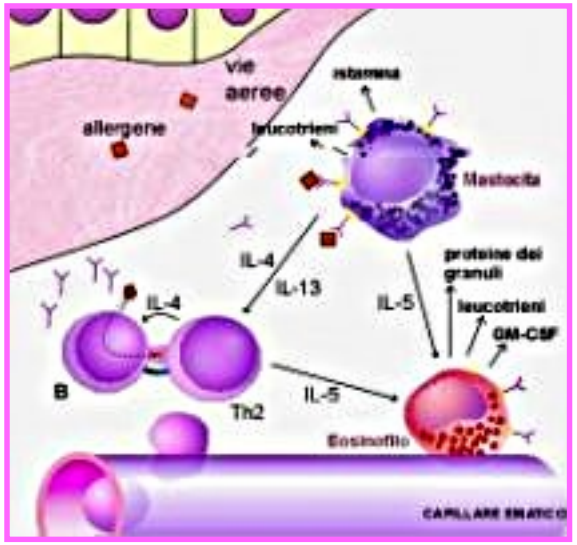
What is an allergic reaction?

An allergic reaction is the response of the body's immune system to normally harmless substances (known as allergens), such as pollens, foods, and house dust mites. When the immune system encounters these substances for the first time, it produces large numbers of antibodies, called IgE antibodies, which bind to the surface of mast cells (i.e. tissue cells). This is known as sensitisation. The next time the body encounters that particular allergen, the IgE antibodies on the surface of the mast cells are activated, causing the release of chemicals such as histamine, which cause the allergic symptoms.



Sensitisation



Allergic reaction

Food allergy IgE mediated

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What are the symptoms?

Allergic symptoms can range from mild (causing discomfort), to life threatening. Common symptoms affect the face, skin, respiratory system and the gut. Symptoms affecting the face or skin include a runny or itchy nose, dry mouth, itchy eyes, sneezing, or a rash (itchy red skin or hives). In the windpipe and lungs allergies can cause wheezing and shortage of breath, and in the gut, symptoms such as abdominal discomfort, nausea, vomiting and diarrhoea may occur.

A severe allergic reaction is known as anaphylaxis, and can be life-threatening. Anaphylaxis causes closing of the throat and difficulty breathing. It may also result in a drop in blood pressure, abdominal pain and vomiting and unconsciousness. People experiencing anaphylaxis should be treated immediately.

Table 2 | Clinical features of IgE-mediated food allergy

Local oral & orbital	Dermatological	Gastrointestinal	Respiratory	Systemic
Itching of palate/lips	Acute urticaria	Nausea	Nasal itching	Hypotension
Swelling of lips/ tongue	Flushing	Abdominal pain	Rhinorrhoea & nasal obstruction	
Eye itching, redness and watering	Angioedema	Vomiting	Sneezing	
Periorbital oedema	Exacerbation of existing eczema	Diarrhoea	Laryngospasm	
	Morbiliform rash		Dyspnoea, wheeze	

Food allergy IgE mediated

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How common are food allergies?

The prevalence of food allergy varies between different ages. In infancy, 8-10% of the population have an allergy, which decreases to around 4% during childhood. By adulthood, only about 1-2% of adults suffer from a food allergy. It is worth noting that the percentage of people who think they are allergic (i.e. are self-diagnosed) is higher than the percentage of people who are actually diagnosed. This discrepancy highlights the need for accurate diagnosis to avoid unnecessary dietary restrictions and to provide reliable prevalence data.

Frequency of food allergies in adults and children

Food	Prevalence (%)
Young children	
Cow's milk	2.5
Egg	1.3
Peanut	0.8
Soy	0.4
Tree nut	0.2
Shellfish	0.1
Adults	
Shellfish	2
Peanut	0.6
Tree nut	0.5
Fish	0.4

Is it possible to develop or lose an allergy during your lifetime?

Most allergies begin in childhood, or as a teenager, but it is possible to develop an allergy at any point in your life. Childhood allergies can be outgrown later in life, but that is not common for late onset allergies. Mild allergic reactions may become more serious over time, so it is important to see a doctor even for mild reactions.

Food allergy IgE mediated

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Which are the most common allergy-causing foods?

Although many foods or groups of foods can trigger an allergic reaction, 14 of them have been identified as the most common or serious causes of food hyper-sensitivity in the EU. They are:

Celery
Gluten
Crustaceans
Egg
Fish
Lupin
Milk
Molluscs
Mustard
Peanut
Sesame seed
Soybean
Sulphur dioxide/sulphites
Tree nuts

Almost all the food allergens are proteins present in foods

Food allergy IgE mediated

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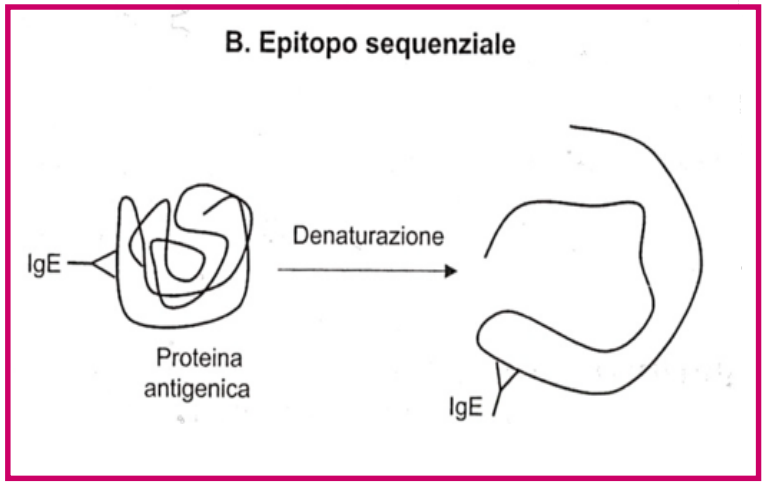
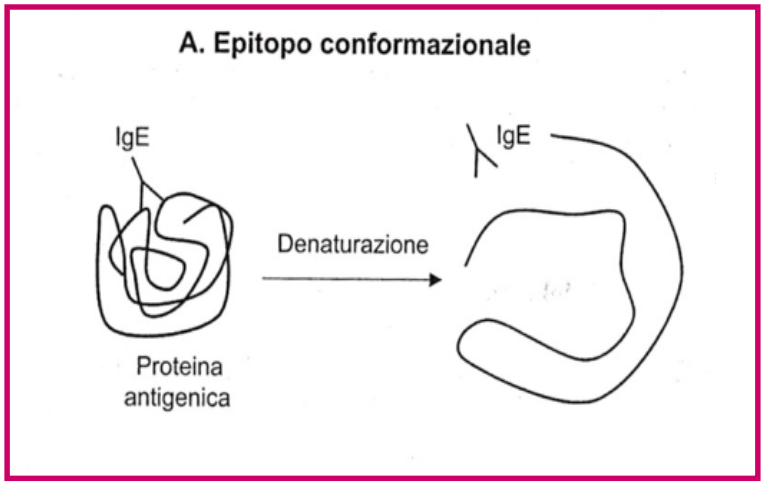
Epitopes?

Epitope is the portion of the protein (allergen) that binds specifically with the antibody

Two types of epitopes can be defined and they are differently susceptible to the foods treatments.



Neighborhood sequence of AA on the primary sequence of the protein. It resists to thermic denaturation, but it is sensitive to enzymatic attacks



Neighborhood sequence of AA in the space linked to the three-dimensionality of the protein. It is susceptible to thermic denaturation

Food allergy IgE mediated

Cross-reactivity

occurs when the proteins in one substance are like the proteins in another. As a result, the immune system sees them as the same. In the case of food allergies, cross-reactivity can occur between one food and another. Cross-reactivity can also happen between pollen and foods or latex and foods.

Because of cross-reactivity, testing and diagnosis of food allergies can be challenging. Since the immune system sees the similar proteins as the same, a positive skin test or blood test (serum IgE) can result for a food, yet the patient may be actually allergic to a substance that is cross-reactive to that food. However, the individual may or may not have any allergic symptoms from eating that food. The individual may not have allergic symptoms from a food that is cross-reactive with another food or pollen to which the individual is allergic. This is true even though they have a positive skin test or blood test to that food. This point cannot be emphasized enough. Many people end up avoiding foods because of a positive test and in some cases, they may have been eating that food before without any problems.

Cross-contact happens only through physical contact but it can happen with any allergen; *cross-reactivity* can happen without physical contact but it tends to happen in specific known patterns.

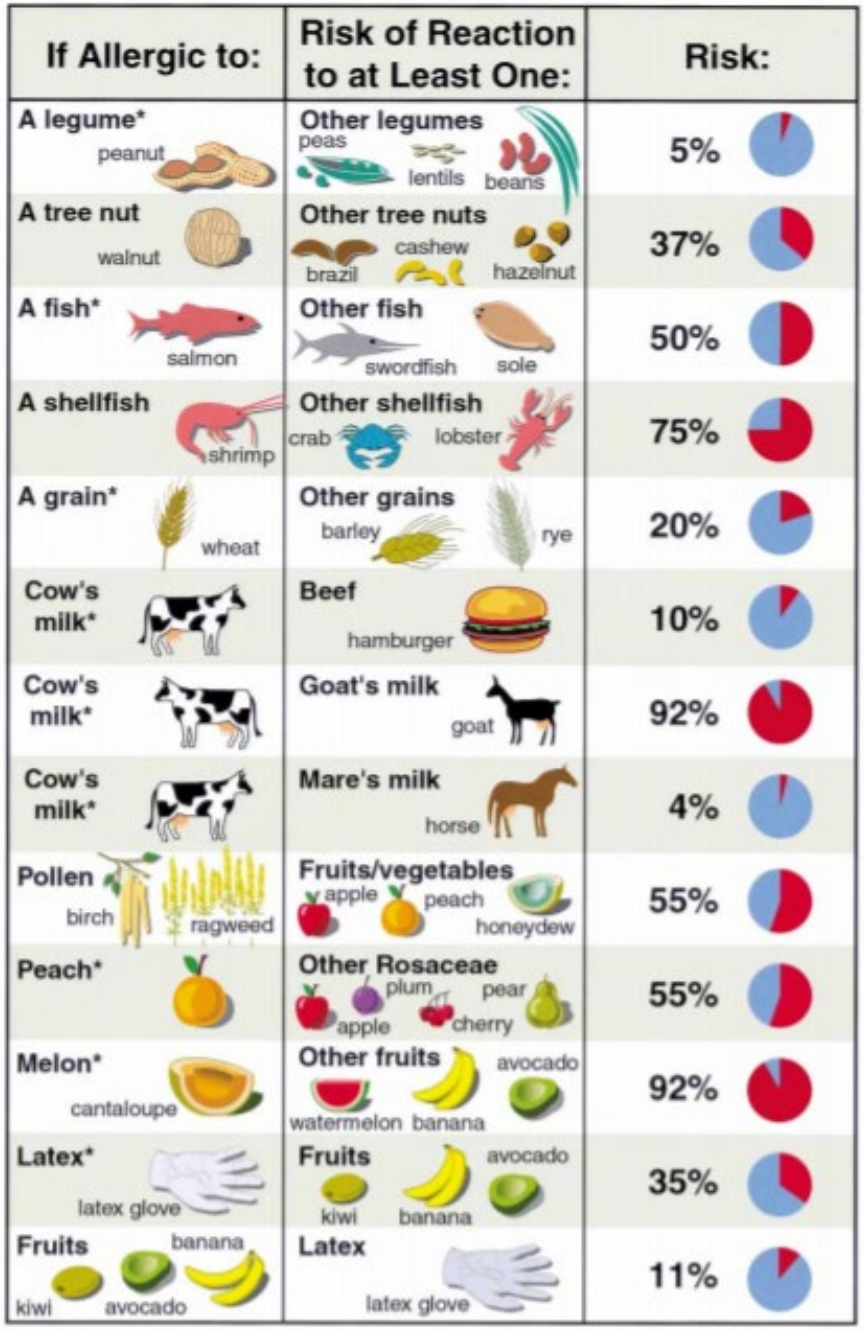


FIG 1. Approximate rate of clinical reactivity to at least 1 other related food. The probability of reacting to related foods varies, depending on numerous factors (see text). *Data derived from studies with DBPCFCs.

Food allergy non-IgE mediated

U11

Non-IgE-mediated food allergies

are reactions in which, following ingestion of one or more foods containing proteins to which the subject is sensitized, occurs an abnormal activation of the immune system, in which they seem to prevail Immunoglobulin production of classes A, G and M and processes mediated by lymphocytes T.

The pathophysiological mechanisms of non-IgE-mediated allergies, unlike those of the IgE-mediated, have not yet been fully defined. These are delayed reactions, of entity proportional to the amount of food introduced, which gives manifestations especially in the skin and in the gastrointestinal tract; in some cases it can be verify a symptomatology also affecting the respiratory tract (Heiner syndrome).

Gastrointestinale disorders	Diarrhea / constipation, bloating, irritable bowel syndrome (IBS), gastritis, reflux ...) Associated malabsorption and / or nutrient deficiencies
Skin symptoms	Eczema, psoriasis, rashes, keratosis pilaris, urticaria
Neurological symptoms	migraines, headaches, memory problems Chronic fatigue, mood swings and depression (in the context of the neuroendocrine immune system), ADHD, neuropathy
Respiratory disease	Chronic cough, wheezing / bronchoconstriction, sinusitis
Metabolic / endocrine / hormonal disorders	Obesity, diabetes, metabolic syndrome, inability to lose weight, weight loss, thyroid illness and diseases, infertility, irregular menstruation
Muscular-skeletal disorders	Stiff or sore joints, arthritis, tendonitis
Immune system and other favored comorbidities	Reduced immune status against viral infections, allergies, autoimmune diseases, heart problems, tumor

Food allergy IgE mediated

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How can I find out if I've got an allergy? Diagnosis

In the first phase of the diagnostic procedure, the patient must undergo a complete physical examination. After that, the specialist can take the medical history, paying particular attention to the type and frequency of symptoms, and trying to relate them to the consumption of certain foods. Subsequently, the following assessment methods can be used.

- Cutaneous tests are often in the form of skin prick tests, where the skin is pricked with a drop of the allergen on it, to see if IgE antibodies are produced (indicating an allergic reaction). Blood tests measure levels of specific IgE antibodies to suspected or known allergens. The likelihood of a clinical reaction increases with higher IgE levels.

- Food challenge tests involve the patient eating suspected allergic foods in gradually increasing amounts to see if allergic symptoms occur. These are always conducted under controlled conditions. Sometimes these tests take the form of double-blind placebo-controlled food challenge tests (DBPCFC).This is where neither the subject nor the investigator knows whether the food contains the allergen under investigation.

- In an elimination test, the suspected foods are removed from the diet. If allergic symptoms disappear, suspected foods are gradually reintroduced into the diet in very small quantities while the person is closely monitored for any symptoms. Once all the suspected foods have been checked out, foods causing problems can be avoided.

Food allergy IgE mediated

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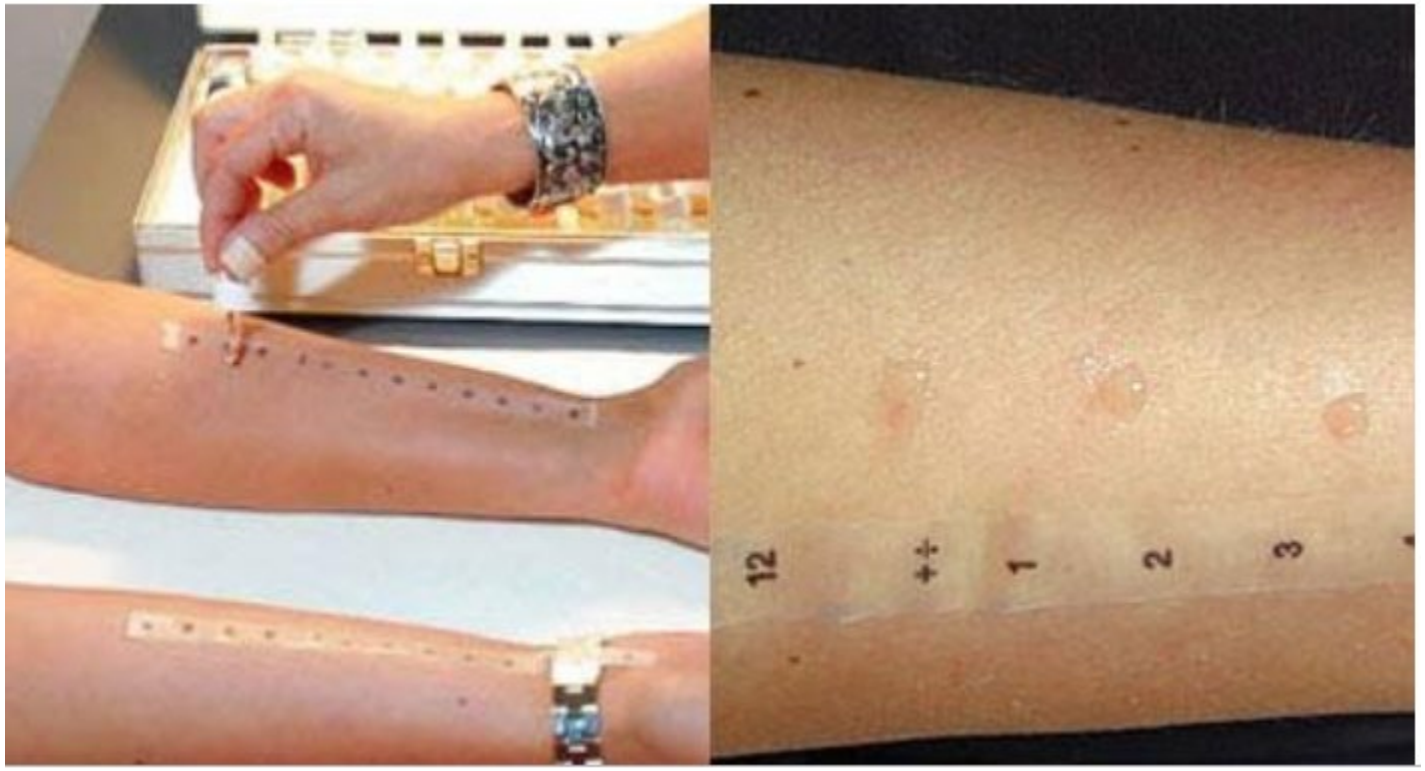
Skin prick test (+ Prick by prick Test)



Food allergy non-IgE mediated

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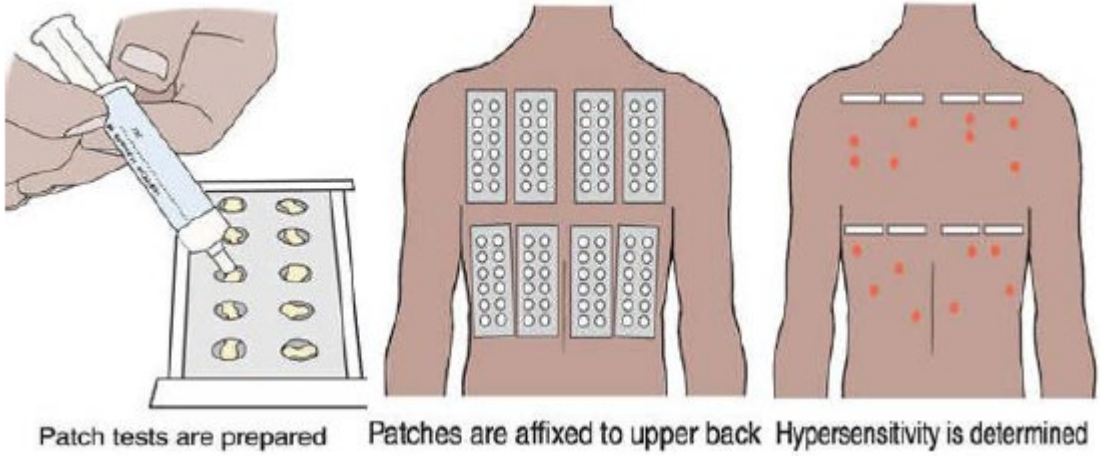
Patch test

validated diagnostic tests to detect non-IgEmediate food allergies are few. What gave the most encouraging results, especially in the dermatitis, in Heiner syndrome and in FPIES, was the patch test, which unlike of the skin prick test is useful in the diagnosis of delayed reactions. The patch test provides for the application on the patient's back of special plasters containing the suspected allergenic substances. These are plastic cells attached to a support, in which small quantities of the substances to be tested are inserted. Reading comes carried out after 48-72 hours. Possible systemic corticosteroid therapies a high dosages or for prolonged periods affect the development of the reaction



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Food allergy non-IgE mediated

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Table 4 | Unvalidated tests with no scientific evidence to support their use in the diagnosis of food intolerance

Test	Description
Allergen-specific IgG or IgG4	Serological testing for IgG or IgG4 against several foods can be performed by enzyme-linked immunosorbent assays and radioallergosorbent assays. The presence of IgG or IgG4 against foods represents exposure to that particular food and indicates immunological tolerance.[92] Therefore, increases in IgG or IgG4 concentration against food or food components are common and clinically irrelevant. However, these commercially available tests are widely available and may lead to inappropriate dietary over-restriction.
Cytotoxic assays	Cytotoxic food testing involves the addition of whole blood to a food extract and is based on the assumption that leucocytes reacting to food antigen exposure can predict intolerance to food. However, the test is not reproducible and positive cytotoxic effects are frequently obtained with foods that produce no clinical symptoms while negative results are obtained with foods that do produce clinical symptoms.[93, 94]
Electrodermal test	A galvanometer is used to measure skin conductivity. The patient holds a negative electrode in one hand and a positive electrode is placed on specific acupressure points. Food extracts in sealed glass vials are put in contact with an aluminium plate within the circuit. Food intolerance is diagnosed when there is a drop in electrical conductivity of the skin. No studies have demonstrated its usefulness to detect food intolerance.[94]
Hair analysis	Bio-resonance analysis of hair based on the belief that anything living emits electromagnetic waves that can be measured as good or bad. However, there is no explanation of how hair analysis might detect food intolerance.[95]
Iridology	Iridology involves the analysis of the iris assuming that all organs are represented in the iris and any irregularities in pigmentation represent dysfunction. There is no scientific evidence to support the use of iridology in the diagnosis of food intolerance.[96]
Kinesiology	The patient holds a sealed glass bottle that contains a test food or food extract while an investigator estimates muscle strength in the other arm. A decrease in muscle power while the food is held is considered to indicate food intolerance. Another method of kinesiology called DRIA measures a change in muscle strength in response to a food extract being placed under the tongue.[93] These tests have no scientific support and have not been validated.
Pulse test	This may be used in combination with provocation-neutralisation or independently. A 16 beats per min change in the pulse rate from baseline indicates food intolerance following sublingual or intradermal exposure to the specific food extract. There is no clinical evidence to support the use of this test.[94]
Sublingual or intradermal provocation-neutralisation	Aqueous food extract is placed under the tongue or intradermally and observed for symptoms to occur (usually 10 min). If symptoms occur, a neutralising dose (diluted dose of the same food extract) is given in the same way. Symptoms are expected to disappear in about the same time period. Adverse outcomes are rare but these tests have failed to show any usefulness in food intolerance.[94]

Food allergy IgE and non-IgE mediated

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Is there a cure?

There is currently no cure for food allergies. The condition must be managed by the susceptible individual's careful avoidance of the allergen-containing food. However, research is being undertaken to try and prevent the initial sensitisation stage in an allergic reaction.

The substantial difference between those who are "truly allergic" and those who are intolerant is one:

- in the IgE mediated, the offending food must necessarily be eliminated from one's diet and often also from the surrounding environment;
- in the non-IgEmediated, the mere fact of reducing portions and resorting to occasional consumption may suffice to avoid the onset of symptoms.

The best way to prevent symptoms is to carefully read the labels of all packaged products, find out about ingredients and cooking methods when eating away from home, and explain the particular needs to your guests or restaurateur.

Food allergy IgE and non-IgE mediated

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How do we know if a food contains an allergen?

To alert consumers to the presence of allergens in food products, food companies use allergen labels. There are two types of allergen labels: mandatory and precautionary.

Mandatory labels: A compulsory label to alert consumers to the presence of allergenic ingredients. Under EU law, the fourteen allergens listed above must be declared on the label of the foodstuff if they are used as an ingredient (including those carried over in processing aids, additives and solvents).

Precautionary labels: If a priority allergen is not used as an ingredient, but there is a chance that the allergen may be present (through cross contamination), food companies often choose to use a voluntary precautionary label, for example 'may contain X', or 'created in a factory that handles X'.

What are the problems with the current labelling system?

Precautionary labels are entirely voluntary and policies of different companies vary regarding both the level of risk required to warrant a label, and how to express or phrase that risk on the label. This can result in confusion for consumers, as the exact level of risk to them posed by that product is unclear.

As technology has advanced to detect lower traces of allergen, companies have been using precautionary labels more frequently, resulting in a limited choice of foods for allergic consumers. This can lead to a lower quality of life and a potential nutritional deficiency. Furthermore, consumer frustration with reduced food options may result in disregard of the precautionary labels and risk-taking behaviour.

Gluten disorders

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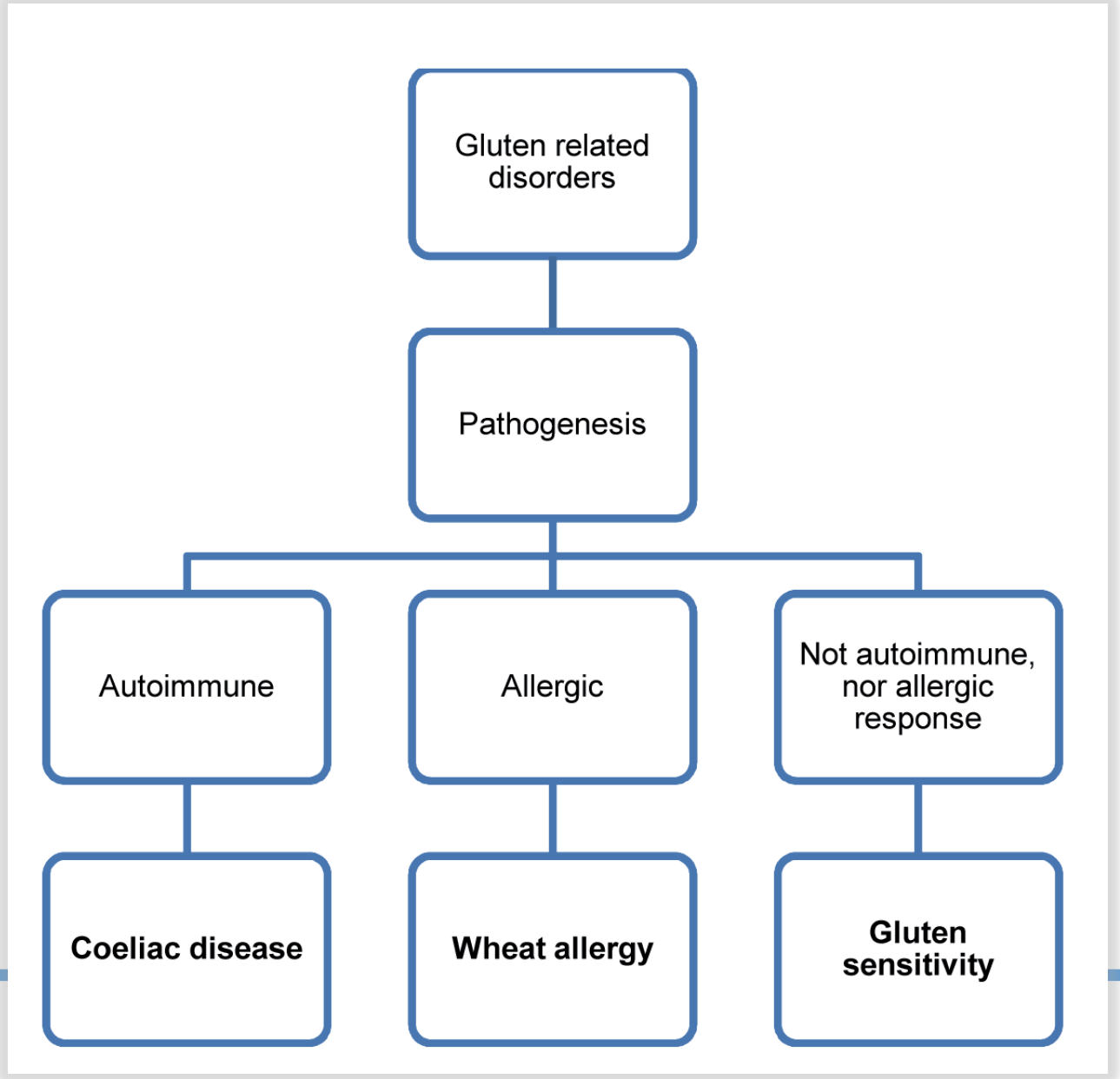

Coeliac diseases

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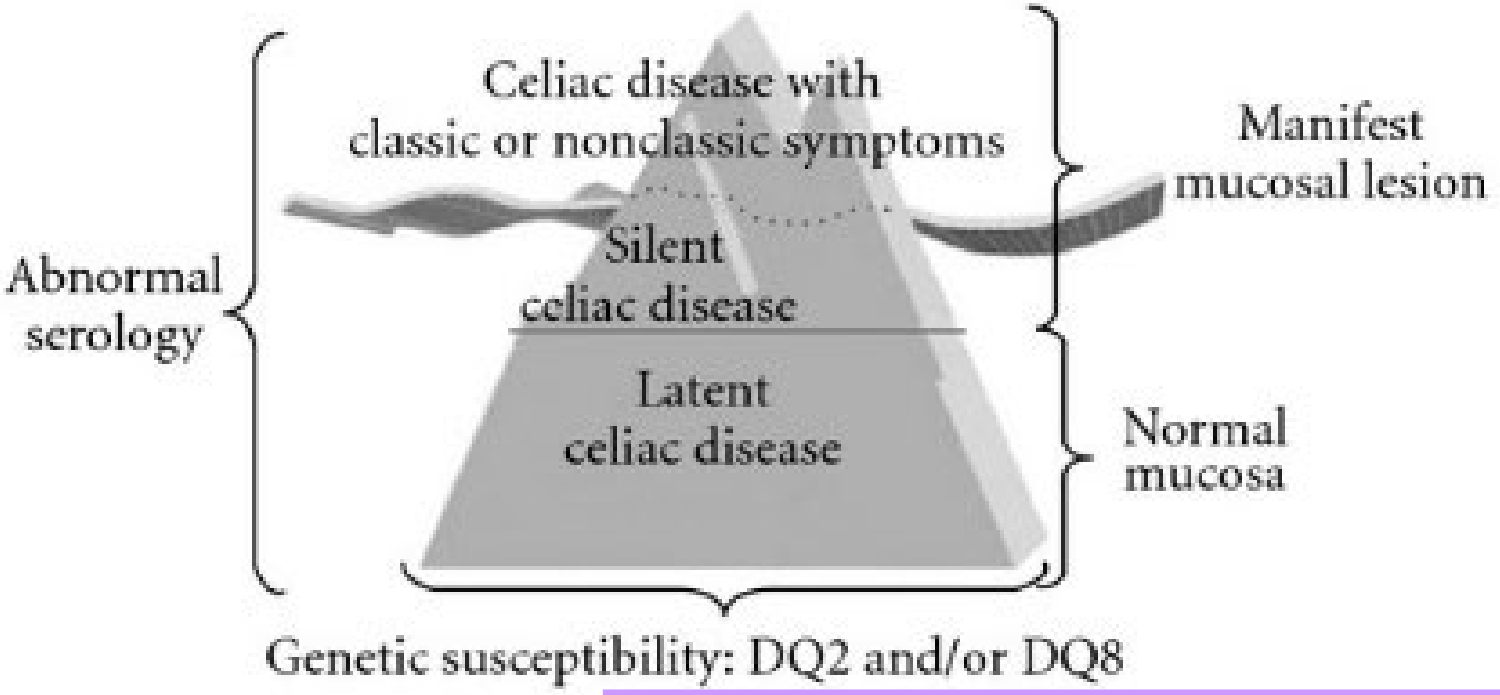

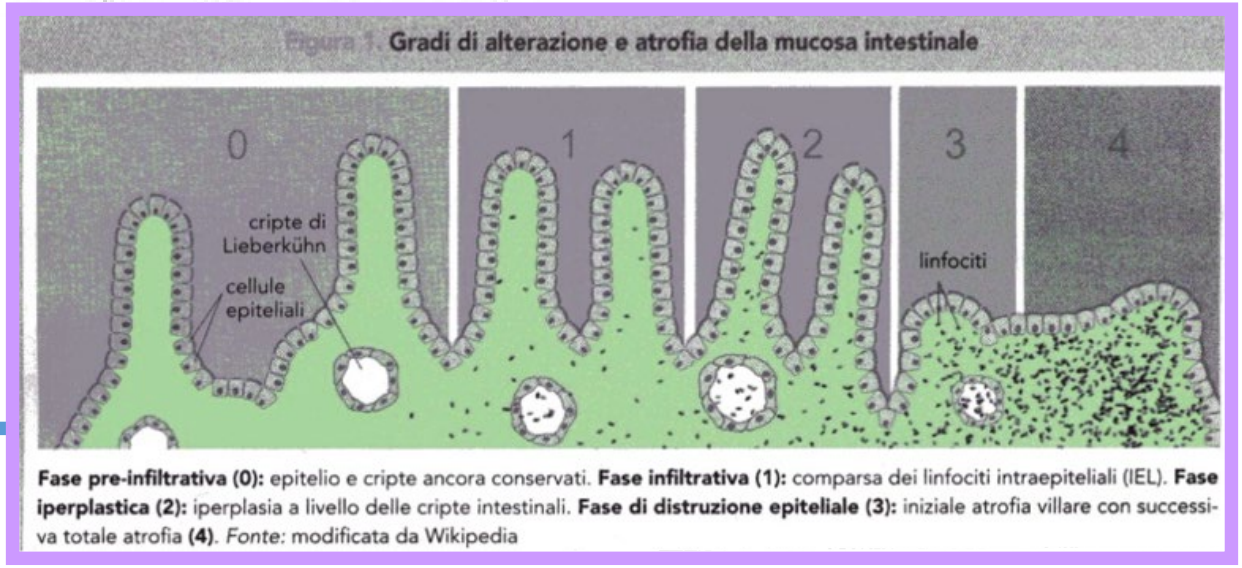

Coeliac diseases- Diagnosis

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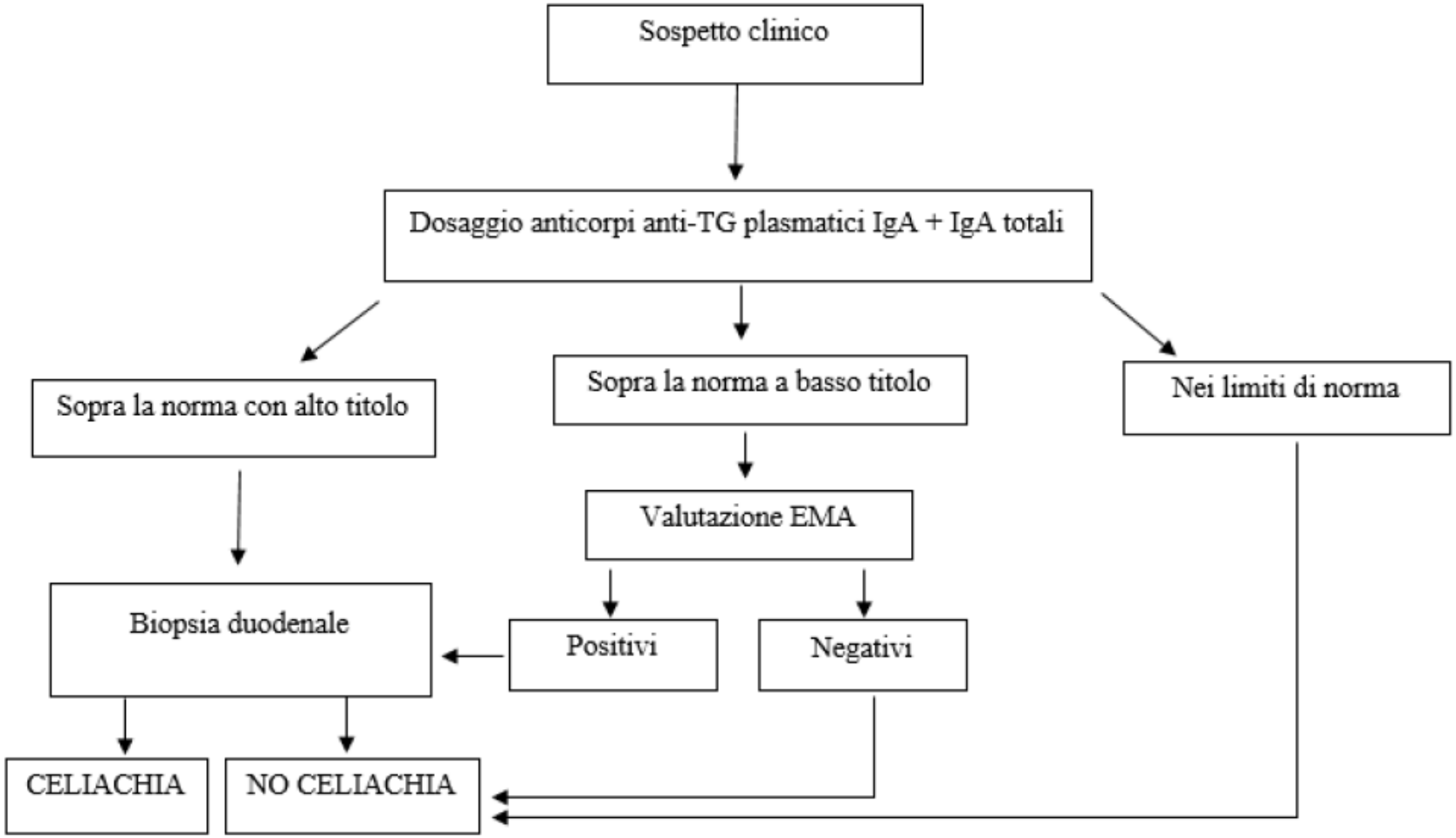

Coeliac diseases and gluten

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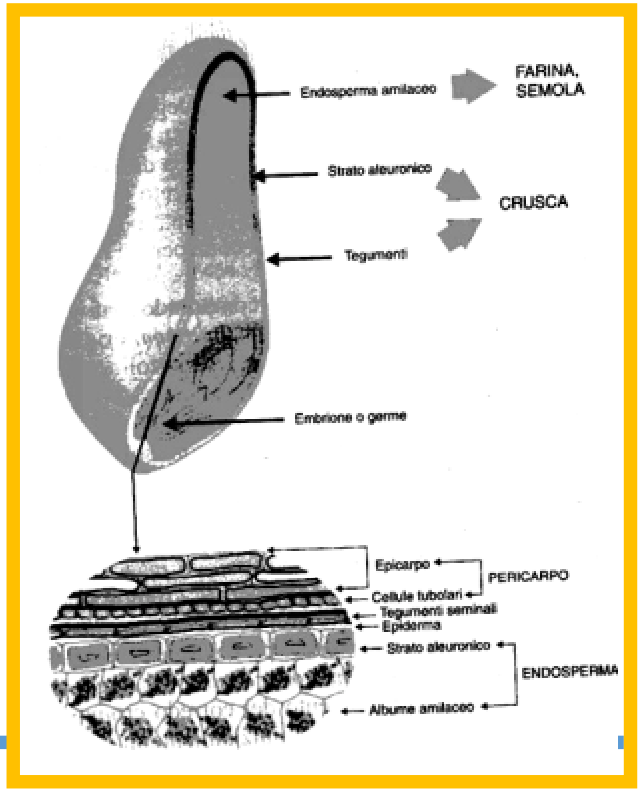
Gluten is a group of proteins, called prolamins and glutelins, which occur with starch in the endosperm of various cereal grains. This protein complex comprises 75–85% of the total protein in bread wheat
It is found in related wheat species and hybrids, such as spelt, kamut, and triticale; barley, rye, and oats as well as products derived from these grains such as breads and malts. Glutens, especially Triticeae glutens, have unique viscoelastic and adhesive properties, which give dough its elasticity, helping it rise and keep its shape and often leaving the final product with a chewy texture. These properties and its relative low cost are the reasons why gluten is so widely demanded by the food industry and for non-food uses.

The prolamines (75-95%) located in the endosperm, are composed of gliadins and glutenins, these proteins are characterized by cysteine, proline and glutamic acid, limiting AA are lysine and methionine.

In contact with water the gliadins and glutenins are joined by hydrogen bonds, disulfide bridges and ionic bonds forming gluten, a fundamental substance for bread making and pasta making.

Cereals banished in gluten disorders are any type of wheat (including flour, semolina and durum), barley, rye, bulgur, Kamut, malt, spelt, couscous

Admitted cereals and derived products are
Brown, wild or white rice, Pasta made from rice, corn, amaranth, quinoa or pure buckwheat, Corn, Quinoa, Millet, Sorghum, Legumes, chest nut



Coeliac diseases and gluten

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In celiac patient exposure to even only a small amount of gluten can lead to malabsorption of some important nutrients including calcium, iron, folic acid, and fat-soluble vitamins because of small-intestine inflammation. A strictly followed gluten-free (GF) diet throughout the patient's lifetime is the only effective treatment for celiac disease; however, elimination of gluten from cereal-based product leads to many technological and nutritional problems.

While a limited amount of gluten is permitted in a celiac patient's diet, the amount of tolerable gluten varies widely between 10 mg and 34–36 mg gluten per day. This has led to confusion about labeling "GF" products. For example, in Canada, such products must meet standards of <20 ppm gluten (20 mg gluten/1 kg), whereas other countries specify a maximum of 200 ppm. However, producing food that provides a daily gluten intake of <10 mg is acceptable. Omitting or reducing gluten lowers the quality of end products; this could be overcome with gluten substitutes.

PRODOTTI COMMERCIALI

20 ppm gluten residue

FARINE
Per pane, pizza, dolci, pasta devono avere:

Miscela di base: riso, mais, miglio, sorgo, amido di mais,patata,tapioca, fecola di patate, farina di soia glucosio,saccarosio, sciroppo di glucosio, latte scremato o siero di latte, proteine isolate della soia e o di altri legumi

Addensanti: farine di guar, semi di carrube, addensanti e/o stabilizzanti chimici, idrocolloidi

Coeliac diseases and gluten

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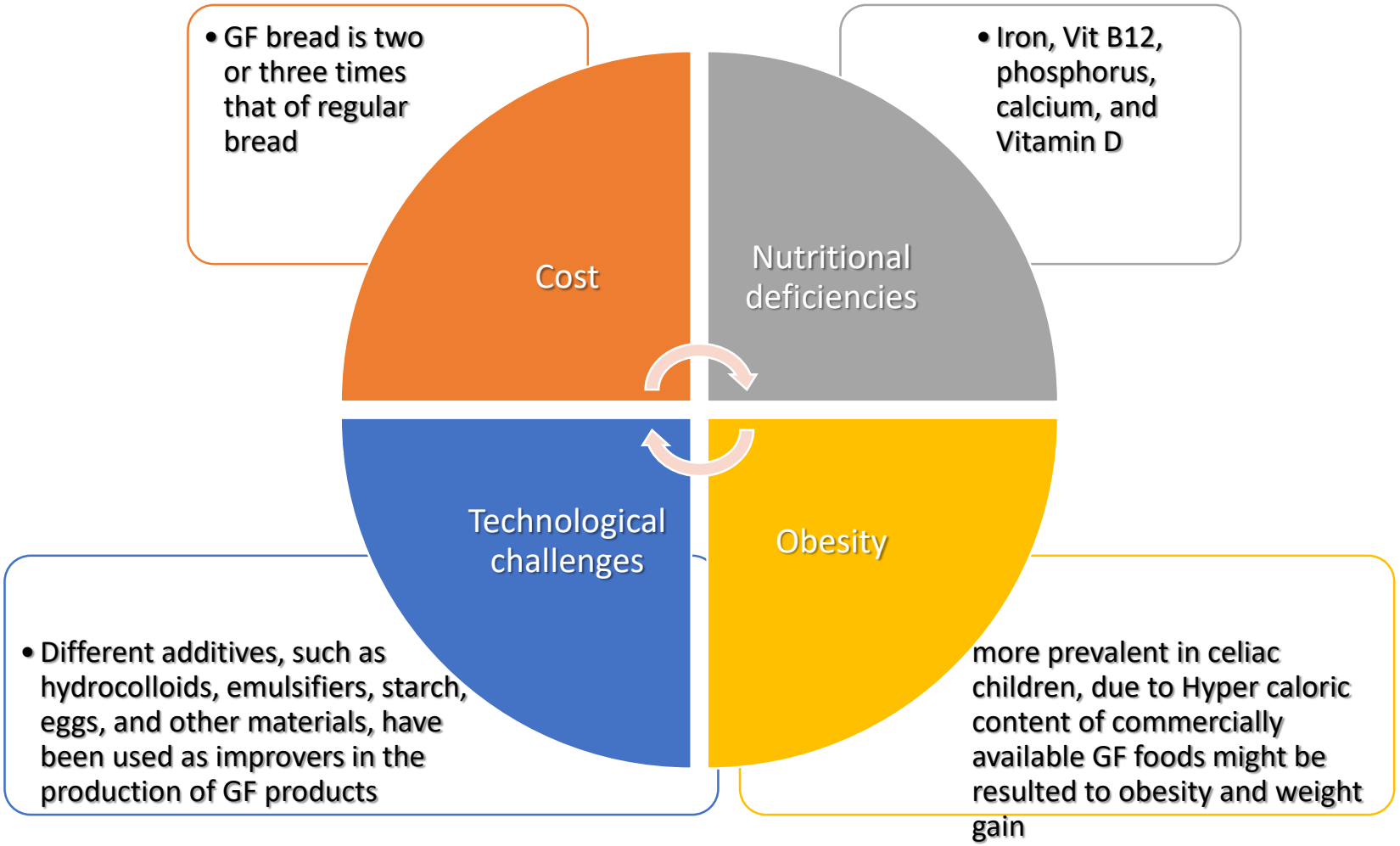

Tabella 3.9 : Confronto delle etichette dei prodotti gluten-free e di quelli tradizionali.

Contenente glutine	Gluten-free
Pasta	
1-Ingredienti: semola di grano duro,acqua **2-Ingredienti**: semola di grano duro,acqua	**1-Ingredienti**: farina di riso, farina di mais, acqua, proteine isolate di pisello, emulsionante (E471) **2-Ingredienti**: farina di mais, farina di grano saraceno, farina di riso, acqua
Base per pizza / pane (confezionato)	
Ingredienti: Farina di frumento, acqua, latte intero in polvere, sale, lievito di birra, margarina vegetale, lecitina di soia, amido modificato.	**Ingredienti:** Amido di mais, acqua, farina di riso, fecola di patate, lievito, addensante (farina di guar), emulsionante (E471), proteine del latte, sale, acidificanti
Biscotto frollino	
Ingredienti: Farina di frumento, zucchero, grassi vegetali, uova, amido di frumento, agenti lievitanti, sciroppo di saccarosio invertito, latte in polvere, sale, aromi, lecitina di soya.	**Ingredienti**: Farina di mais, amido di mais, farina di amaranto 20%, zucchero, margarina vegetale, lecitina di soya, proteine dell'uovo, miele, uova, lievito, sale, aromi, emulsionante (E471, E475)

(Fonti: Ingredienti Barilla, Mulino bianco, Schar,ds4you, BiAglut)

Le funzioni principali degli isolati proteici possono essere quindi riassunte in quattro punti:

1. **Buone proprietà emulsionanti**, schiumogene e grande stabilità in un ampio range di pH (da 3 a 9)
2. **Proprietà gelificanti e viscosizzanti** tali da poter sostituire l'uso degli idrocolloidi, modificando in modo naturale le proprietà tecnologiche dell'impasto
3. **Buona solubilità ed idratabilità**. Le proteine sono molto idrosolubili, inoltre trattenendo l'acqua permettono di mantenere nell'impasto il giusto grado di umidità
4. **Capacità di imbrunimento** (tipico delle proteine del latte e dell'uovo), che permette durante la cottura di produrre il richiesto aspetto "dorato" tipico nei prodotti da forno

Un continuativo ed eccessivo consumo di questi alimenti può modificare i rapporti tra i nutrienti, portando ad una condizione in un certo senso sfavorevole sotto il profilo metabolico. Se infatti prima della diagnosi e dell'inizio della dieta aglutinata la patologia intestinale limitava l'assorbimento dei nutrienti e rendeva ragione di una tendenza al calo ponderale, la correzione dell'alterazione intestinale attraverso l'utilizzo degli alimenti dietoterapeutici, porta ad un ripristino dell'assorbimento intestinale, sia di tutti quei nutrienti essenziali per il benessere dell'organismo che, in larga misura anche dei grassi, costituenti questi alimenti particolari. **Si stima infatti che il 15% dei soggetti celiaci che non seguono una dieta variata secondo la piramide alimentare, sviluppino dopo alcuni anni di dietoterapia alterazioni metaboliche a livello lipidico e/o glucidico**.

Coeliac diseases and gluten

U11

Regulation (EU) No 828/2014

Article 3 Information to consumers

1. Where statements are used to provide information to consumers on the absence or reduced presence of gluten in food, such information shall be given only through the statements and in accordance with the conditions set out in the Annex.

2. The food information referred to in paragraph 1 may be accompanied by the statements 'suitable for people intolerant to gluten' or 'suitable for coeliacs'.

3. The food information referred to in paragraph 1 may be accompanied by the statements 'specifically formulated for people intolerant to gluten' or 'specifically formulated for coeliacs' if the food is specially produced, prepared and/or processed to:

(a) reduce the gluten content of one or more gluten-containing ingredients; or
(b) substitute the gluten-containing ingredients with other ingredients naturally free of gluten.

Decreto 17 maggio 2016 Modifiche all'art. 1 del D.M. 8 giugno 2001

1. Il comma 1 dell'art. 1 del decreto e' sostituito dal seguente:

«1. Rientra nei livelli essenziali di assistenza sanitaria l'erogazione dei prodotti alimentari di seguito elencati:

a) alimenti a fini medici speciali per persone affette da malattie metaboliche congenite;

b) alimenti a fini medici speciali per persone affette da fibrosi cistica o malattia fibrocistica del pancreas o mucoviscidosi,

c) alimenti con dicitura «senza glutine, specificatamente formulati per celiaci» o «senza glutine, specificatamente formulati per persone intolleranti al glutine» per persone affette da morbo celiaco, compresa la variante clinica della dermatite erpetiforme

Food intolerance

U11

Food intolerances are adverse reactions that occur later ingestion of one or more foods, in which is not involved immune. The main causes are: the defect of transport mechanisms or systems enzyme; gluten sensitivity, which is not attributable to either celiac disease or to wheat allergy; the pharmacological type reactions, which can develop into following the ingestion of foods containing potentially pharmacological active substances. Non-immunological adverse reactions occurring in following the ingestion of food, which are not part of any of the previous mechanisms and for which the causes are unknown, they are called food intolerances indefinite or idiosyncratic.

Food group	Food	Percentage of subjects reporting symptoms
Cereal products	Wheat bread	4.8–34.8
Vegetables	Cabbage	9.6–57
	Onion	8.9–56
	Peas/beans	21.4–46
Dairy products	Milk	4.4–41.7
Miscellaneous	Hot spices	25.9–45
	Fatty/deep fried	13.3–44
Drinks	Coffee	26.2–39

Lactose intolerance

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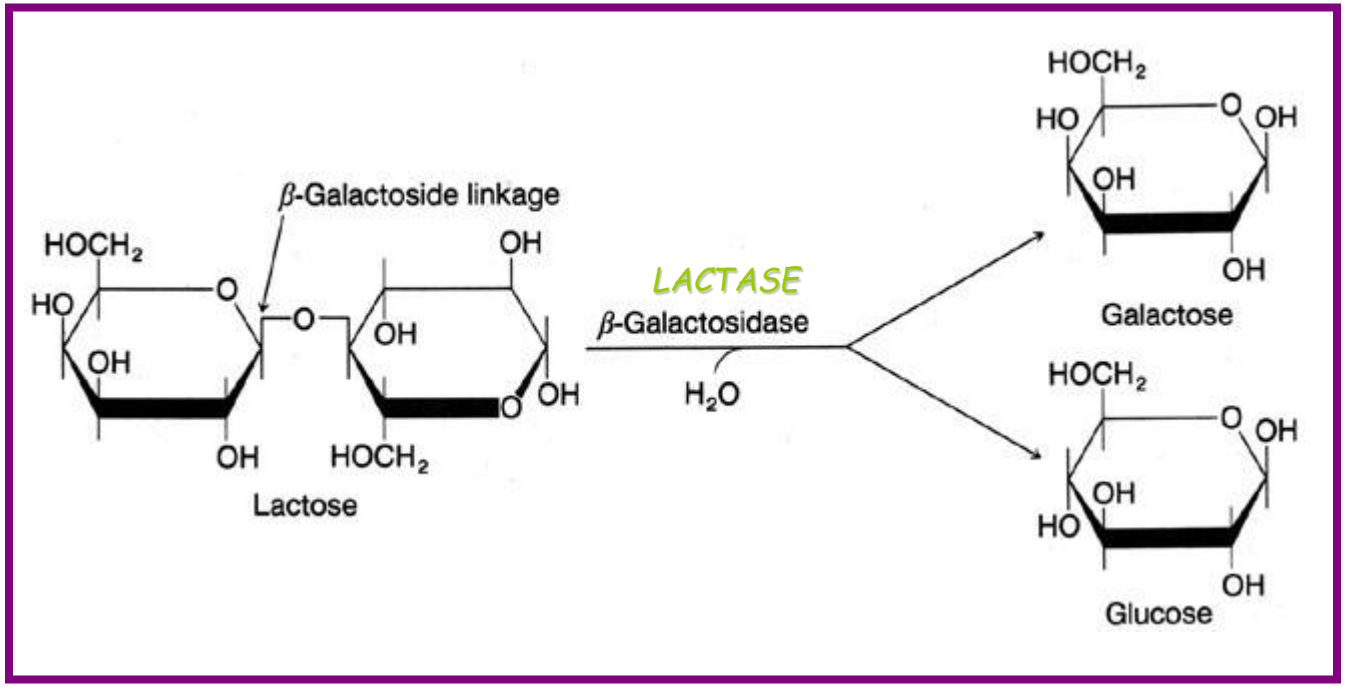

People with lactose intolerance are unable to fully digest the sugar (lactose) in milk. As a result, they have diarrhea, gas and bloating after eating or drinking dairy products. The condition, which is also called lactose malabsorption, is usually harmless, but its symptoms can be uncomfortable.

Lactose intolerance

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Primary lactose intolerance

This is the most common type of lactose intolerance. People who develop primary lactose intolerance start life producing plenty of lactase — a necessity for infants, who get all their nutrition from milk. As children replace milk with other foods, their lactase production normally decreases, but remains high enough to digest the amount of dairy in a typical adult diet.

In primary lactose intolerance, lactase production falls off sharply, making milk products difficult to digest by adulthood. Primary lactose intolerance is genetically determined, occurring in a large proportion of people with African, Asian or Hispanic ancestry. The condition is also common among those of Mediterranean or Southern European descent.

Secondary lactose intolerance

This form of lactose intolerance occurs when your small intestine decreases lactase production after an illness, injury or surgery involving your small intestine. Among the diseases associated with secondary lactose intolerance are celiac disease, bacterial overgrowth and Crohn's disease. Treatment of the underlying disorder may restore lactase levels and improve signs and symptoms, though it can take time.

Congenital or developmental lactose intolerance

It's possible, but rare, for babies to be born with lactose intolerance caused by a complete absence of lactase activity. This disorder is passed from generation to generation in a pattern of inheritance called autosomal recessive, meaning that both the mother and the father must pass on the same gene variant for a child to be affected. Premature infants may also have lactose intolerance because of an insufficient lactase level.

Lactose intolerance

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Risk factors

Factors that can make you or your child more prone to lactose intolerance include:

- Increasing age. Lactose intolerance usually appears in adulthood. The condition is uncommon in babies and young children.
- Ethnicity. Lactose intolerance is most common in people of African, Asian, Hispanic and American Indian descent.
- Premature birth. Infants born prematurely may have reduced levels of lactase because the small intestine doesn't develop lactase-producing cells until late in the third trimester.
- Diseases affecting the small intestine. Small intestine problems that can cause lactose intolerance include bacterial overgrowth, celiac disease and Crohn's disease.
- Certain cancer treatments. If you have received radiation therapy for cancer in your abdomen or have intestinal complications from chemotherapy, you have an increased risk of lactose intolerance.

The signs and symptoms of lactose intolerance usually begin 30 minutes to two hours after eating or drinking foods that contain lactose. Common signs and symptoms include:

Diarrhea
Nausea, and sometimes, vomiting
Abdominal cramps
Bloating
Gas

Lactose intolerance

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Complications of lactose intolerance

Milk and other dairy products contain calcium, protein and vitamins, such as A, B12 and D. Lactose also helps your body absorb a number of other minerals, such as magnesium and zinc.
These vitamins and minerals are important for the development of strong, healthy bones. If you're lactose intolerant, getting the right amount of important vitamins and minerals can prove difficult.

This may lead to unhealthy weight loss and put you at increased risk of developing the following conditions:
osteopenia – where you have a very low bone-mineral density; left untreated, it can develop into osteoporosis
osteoporosis – where your bones become thin and weak, and your risk of breaking a bone is increased
malnutrition – when the food you eat does not give you the nutrients essential for a healthy functioning body; this means wounds can take longer to heal and you may start to feel tired or depressed

Lactose intolerance

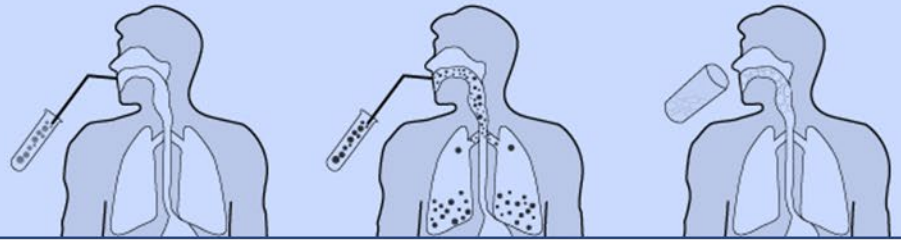
Diagnosis

- Analisi del pH fecale (Stool Acidity Test)
- Test di Tolleranza al Lattosio (Lactose Tolerance Test)
- **Test del respiro al Lattosio (Lactose Breath Test)**
- Tempo di Transito Orocecale al Lattosio (Oro-Cecal Transit Time Lactose Test)
- **Analisi Polimorfismi Gene LCT (Congenital Lactose Deficiency)**

Come si esegue il breath test?

I test del respiro sono sicuri e semplici da eseguire. Bastano 3 passi:

1. Raccogliere l'espirato (campione - BASE)
2. Assumere il pasto del test (liquido o solido)
3. Raccogliere l'espirato ad intervalli regolari (campioni - POST)



Test genetico

Lactease® DNA

Dal campione di saliva che ci hai inviato abbiamo effettuato l'analisi del tuo gene lattasi. Tutte le considerazioni relative all'intolleranza al lattosio riportate di seguito sono state elaborate dall'interpretazione del tuo profilo genetico per il gene lattasi.

Risultato genetico

Forma gene LATTASI: ***non ottimale***

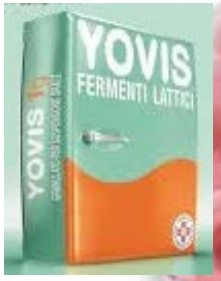
Predisposizione: ***intolleranza al lattosio***

La dimostrazione di malassorbimento di lattosio non indica necessariamente che un soggetto avrà i sintomi.

Alimenti con lattosio

Alimenti senza lattosio

Fonti nascoste di lattosio



Lactose intolerance

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INTEGRATORI di LATTASI

β-galattosidasi da

Aspergillus oryzae,

Aspergillus niger,

Kluyveromyces lactis

INTEGRATORI di PROBIOTICI

Lactobacilli,

Bifidobatteri,

Streptococchi

INTEGRATORI COMBINATI

Lattasi,

Enzimi digestivi,

Probiotici,

Botanicals,