**CLIL lesson – 3.**

**Subject: ENGLISH/SCIENCE**

**Teachers**: Mgr.Králiková Lucia and PhD.Foldesová Ildikó(Science teacher)

**Class:** 7B

**Lenght of lesson**: 90 minutes

**Topic:** Diabetes, Lactose free diet, Gluten free diet

### Teaching methods: Teacher-Centered Instruction,  Cooperative Learning and group work, practical learning

**Training aids**: microscope, pipete,tweezers, petri ´s dish, internet

**Educational goals:** The main goal is to teach students to work in groups and proof the profeins and starch in chosen plants, create a suitable diet for people suffering different disadvanteges

**Vocabulary:**

 grinding bowl-miska na brúsenie

Beaker-kadička

test tubes-skúmavky

test tube stand-stojan na skúmavky

dropper-kvapkadlo

funel-lievik

filter paper-filtračný papier

gluten-lepok

**The structure of the lesson: 1.motivation discussion**

 **2.students divided into groups-one doing practical chemical experiments the other group reading text and creating a suitable breakfast, lunch and dinner for people with restricted diet**

 **3.reading text in English and understanding it-both groups**

 **4.practical chemical experiments in chemical laboratory**

 **5. searching on internet for information**

 **6.presentation of each group a their results**

**Main activity: blending real-life situation with science theory**

**Evaluation/Assesment: each group´s presentation was evaluated oraly and positives were picked –up**

1.Experiment: PROOF OF THE PRESENCE OF PROTEINS IN PEA SEEDS

Tools and chemicals:

Dry pea seeds,

grinding bowl,

beaker,

test tubes,

test tube stand,

dropper,

funnel,

filter paper.

2% solution of potassium hydroxide KOH,

 acetic acid CH3COOH,

 ethanol CH3CH2OH,

distilled water.

Work procedure:

Grind the dry pea seeds thoroughly in a mortar and pour the flour into the beaker. Pour 50 cm3 of water and 5 cm3 of 2% KOH solution over the pea flour. After an hour, filter. Carefully drop acetic acid into the first test tube with 5 cm3 of the filtrate, pour a small amount of ethanol into the second test tube with 5 cm3 of the filtrate.

Observation and Explanation:

Proteins dissolve in a weakly alkaline solution.

When you neutralize the filtrate with dilute acetic acid, the proteins precipitate.

When there is more acid in the filtrate, the proteins will dissolve again. In contrast to coagulation by boiling (coagulation changes the properties of proteins - they denature - this is an irreversible event), in this case protein precipitation is a reversible event.

When you add ethanol to the filtrate, an insoluble precipitate forms.

2.Experiment: PROOF OF STARCH IN A POTATO SLICE

Tools and chemicals:

beaker,

 knife,

 potato,

 iodine solution,

bowl,

 pipette,

 microscope technique

Procedure: We will try to scrape the mushy substance from a slice of potato. Place a small amount of material on a glass slide and apply drops of iodine solution. Cover with a coverslip and observe under a microscope.

Observation and Explanation:

A dark blue color will appear on the potato mass. Iodine solution is used to prove starch. The presence of starch is evidenced by a dark blue coloration.

3.Experiment: PROOF OF STARCH IN CORN

Tools and chemicals:

breadcrumbs,

corn,

iodine solution

Work procedure:

Spread 2 grains of corn in the spreader. Add a small amount of water to the mass, mix and apply drops of iodine solution.

Observation and Explanation:

The presence of starch is proven by the dark blue coloring of the prepared mass.

Diabetes mellitus

- is caused by abnormal glucose metabolism in the body.

Type 1 diabetes (insulin-dependent diabetes) is caused by insufficient insulin production in the pancreas.

 Type 2 diabetes (insulin resistance) is caused by impaired glucose transport in the body.

Type 1 diabetes most often occurs before the age of 30, while type 2 diabetes occurs in people after the age of 40.

 The causes of diabetes are:

- metabolic disorders;

- reduced immunity;

- abnormalities of the pancreas;

-cardiovascular diseases;

- overweight;

- adrenal gland dysfunction;

- uncontrolled use of corticosteroids.

Risk factors for diabetes include unhealthy habits, a sedentary lifestyle and frequent stress. The risk of developing type 2 diabetes is also increased by an inappropriate diet and a lack of vitamins and minerals.

What is appropriate to eat with diabetes?

A daily diet for diabetes can reduce the symptoms of the disease and improve mood. The diet for diabetes should be determined by an endocrinologist or dietician.

With type 1 diabetes, it is possible to consume:

- low-fat dairy products;

- legumes;

- vegetables;

- unsweetened fruits and berries (cranberries, raspberries, grapefruit);

- bread with bran;

- lean meat and fish.

Diet for elderly people with diabetes should include whole grain cereal products. There should also be a sufficient amount of fiber in the diet.

The type 2 diabetes diet includes cooking (boiling and steaming) foods. With type 2 diabetes (table 9), it is possible to consume:

- pastry made from coarsely ground bran;

- lean meat and fish soups;

- grain foods and whole grain pasta;

- vegetarian vegetable soups;

- sweets with sweeteners.

Diet for diabetes mellitus should be divided into smaller portions. Food should be eaten in small portions at least five to six times a day. Iodine deficiency in diabetes can worsen its symptoms, so the diet should include foods rich in iodine. It is also necessary to make an appointment with an endocrinologist to prepare a menu and balance your diet.

What is not suitable to eat with diabetes?

Diabetes causes obesity because insulin affects the level of glucose, which is stored in the body in the form of fat stores. Fatty, sweet, spicy and fried foods should be avoided in order to prevent obesity and reduce the symptoms of diabetes. For the treatment of overweight and obesity, it is necessary to consult an endocrinologist.

A diabetic diet for slim diabetics includes foods that contain enough calories. Prohibited foods for diabetes are:

♣ sweets;

♣ yeast bread;

♣ fatty meat;

♣ smoked meat and sausages;

♣ mayonnaise and margarine;

♣ food preserved in oil;

♣ sweet fruits and berries.

Food for diabetics should be completely sugar-free and contain enough fiber. Eating fatty and salty foods is prohibited.

Gluten-free diet

A gluten-free diet is a diet that does not contain gluten.

A gluten-free diet can be prescribed by your doctor if you have been diagnosed with celiac disease.

A person can also decide for a gluten-free diet on his own for preventive health reasons.

Celiac disease is a disease in which the body overreacts to gluten. The organism's reaction is strongest in the mucosa of the small intestine, where chronic inflammation and degeneration of the mucosa and deeper layers of the intestinal wall occur, which causes impaired absorption of micronutrients (e.g. vitamins, calcium, iron).

Gluten is an indigestible mixture of vegetable proteins that are present in the following cereals: wheat, barley, rye, oats, triticale, bulgur, kamut.



How does celiac disease manifest itself?

Manifestations in the area of ​​the digestive system: cramps and pain in the abdominal area, a feeling of bloating in the abdomen, spilling of intestinal contents with sound effects, diarrhea or constipation, or changed color and smell of stool, flatulence (gas), chronic fatigue, muscle loss and weight loss.

Manifestations other than digestion:

anemia,

migraines,

 infertility,

bone pain,

 increased caries and even loss of teeth,

 skin diseases (e.g. dermatitis herpetiformis),

mood changes, etc.

Gluten allergy or celiac disease?

These are two different diseases that have different symptoms, causes and therapies. Symptoms of allergy are, for example: burning in the mouth, burning in the throat, runny nose, vomiting, hives, eczema and others. The onset of an allergy is usually quick, within a few minutes. He consults an allergist about allergy treatment.

Celiac disease needs to be examined by a gastroenterologist and is manifested by frequent diarrhea, bloating, fatigue and other symptoms that can appear an hour to a few days after consuming gluten. It is an immune intolerance that is still incurable. Therefore, a gluten-free diet is the only dietary option for celiacs.

Prohibited foods on a gluten-free diet:

• Cereals containing gluten:

wheat,

 rye,

barley,

 oats,

triticale,

 bulgur,

kamut

• Finished products made from cereals containing gluten: sprouts, bran, groats, flour, vegetable protein substitutes for meat, soy sauce made with wheat, some salad dressings, powdered sauces, soups and semi-finished products containing wheat flour, pastries, flours, desserts, biscuits, cereals, bars, wafers and others

• Beverages: beer, instant coffee sweetened with barley malt

• Additives in ready-made foods: hydrolyzed vegetable proteins, starch, modified starch, flavors, aromas, dextrin, malt, barley or wheat syrup

• Other sources of gluten: glue on envelopes and stamps, lipstick, some medicines

Suitable food for a gluten-free diet:

• Gluten-free cereals: wheat (millet),

 buckwheat,

amaranth,

corn,

rice

• Legumes: soybeans, lentils, all types of beans, chickpeas, peas (legume flours and products from them - tofu, plant-based vegan cuts...)

• Seeds and nuts: flax, pumpkin, sunflower, chia, almonds, walnuts, hazelnuts, Brazil nuts, coconuts, cashews and others

• Fruits and vegetables: all kinds

• Beverages: mineral and table waters, teas, fruit and vegetable juices, coffee, spirits, wine

• Sweeteners: honey, maple syrup, cane molasses, cane brown sugar, plum syrup, coconut syrup, date syrup, agave syrup

• Snacks: chocolate, cocoa, ketchup, mustard

• Other foods that are not listed in the previous list of unsuitable foods or do not contain any of its items.

Milk allergy and lactose intolerance

Many of you may think that these are the same two things, but they are not. Milk allergy usually occurs in early childhood and usually subsides by puberty. If it appears in adults, it is often a trigger for other food allergies. It is an unwanted reaction of the body to the protein in cow's milk. That is why diet is very important for milk allergies.

Lactose intolerance is a lifelong issue. There may be periods when you absolutely cannot have lactose and there may also be periods when you have no reaction to lactose. As a rule, you have to learn to live with it for the rest of your life.

Lactose intolerance means that you lack the enzyme lactase. This enzyme is involved in the splitting of milk sugar - lactose. Thus, the human digestive tract is not able to absorb lactose, but it can break it down into smaller parts. When you are deficient in this enzyme, undigested lactose ferments in your stomach, resulting in abdominal pain, bloating and diarrhea. In this case, however, there are no skin problems or respiratory problems, as is the case with milk allergy.

Milk allergy usually only concerns cow's milk, while lactose intolerance is also related to other types of milk that contain lactose. You have to be careful because many other milks also contain lactose. Be careful and consult a doctor. In general, less lactose is found in products with a higher fat content. Lactic acid bacteria are suitable for people with lactose intolerance. Lactose-free variants of the products are currently available in regular commercial stores as well as online. It is therefore much easier to shop even with such dietary restrictions and still consume a varied and balanced diet.



Lactose diet - you can eat:

- lactose-free milk

- lactose-free cheese

-lactose-free yogurts

- lactose-free spreads

-products made from lactose-free milk

- lactose-free chocolates

-ghee butter (may contain traces of lactose)

- lactose-free ice cream

💡Don't forget to consume enough calcium. Among the food with its increased content are, for example: buckwheat, peas, broccoli, spinach, pumpkin, cabbage, apricots, pears, grapes and many others.

Classic dairy products containing lactose include:

• cow's milk (all types),

•goat milk,

•cheese,

•ice cream,

• Yogurt,

Food that has some form of dairy as an ingredient and may also contain lactose include:

• biscuits, chocolate and sweets,

• bread and pastries,

• cakes, desserts, puddings,

• breakfast cereals,

• instant soups and sauces,

• processed meat, such as ham or sausages,

•ready meals,

• potato chips, flavored nuts,

 



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