



Diabetic

Retinopathy

วิชาโภชนาการ

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Meaning / Organ function and disease

What is the Diabetes mellitus (DM)

diabetes mellitus : disorder of carbohydrate metabolism characterized by impaired ability of the body to produce or respond to insulin and thereby maintain proper levels of sugar (glucose) in the blood.

Causes and types

Insulin is a hormone secreted by beta cells, which are located within clusters of cells in the pancreas called the islets of Langerhans. Insulin's role in the body is to trigger cells to take up glucose so that the cells can use this energy-yielding sugar. Patients with diabetes may have dysfunctional beta cells, resulting in decreased insulin secretion, or their muscle and adipose cells may be resistant to the effects of insulin, resulting in a decreased ability of these cells to take up and metabolize glucose. In both cases, the levels of glucose in the blood increase, causing hyperglycemia (high blood sugar). As glucose accumulates in the blood, excess levels of this sugar are excreted in the urine. Because of greater amounts of glucose in the urine, more water is excreted with it, causing an increase in urinary volume and frequency of urination as well as thirst.

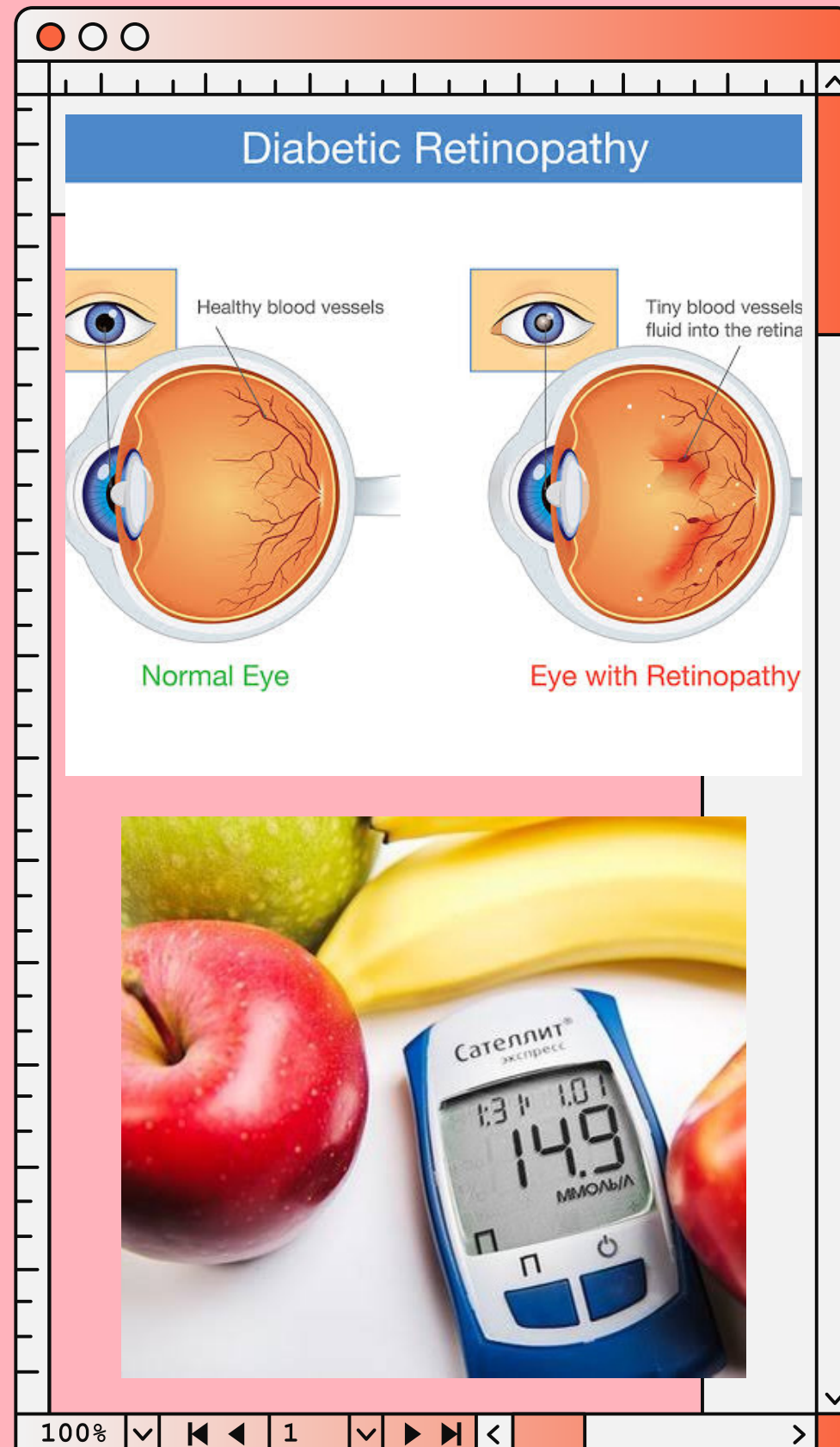


TYPE 1 DIABETES MELLITUS



Type 1 diabetes is usually caused by autoimmune destruction of the islets of Langerhans of the pancreas. Patients with type 1 diabetes have serum antibodies to several components of the islets of Langerhans, including antibodies to insulin itself. The antibodies are often present for several years before the onset of diabetes, and their presence may be associated with a decrease in insulin secretion. Some patients with type 1 diabetes have genetic variations associated with the human leukocyte antigen (HLA) complex, which is involved in presenting antigens to immune cells and initiating the production of antibodies that attack the body's own cells (autoantibodies). However, the actual destruction of the islets of Langerhans is thought to be caused by immune cells sensitized in some way to components of islet tissue rather than to the production of autoantibodies. In general, 2 to 5 percent of children whose mother or father has type 1 diabetes will also develop type 1 diabetes

TYPE 2 DIABETES MELLITUS



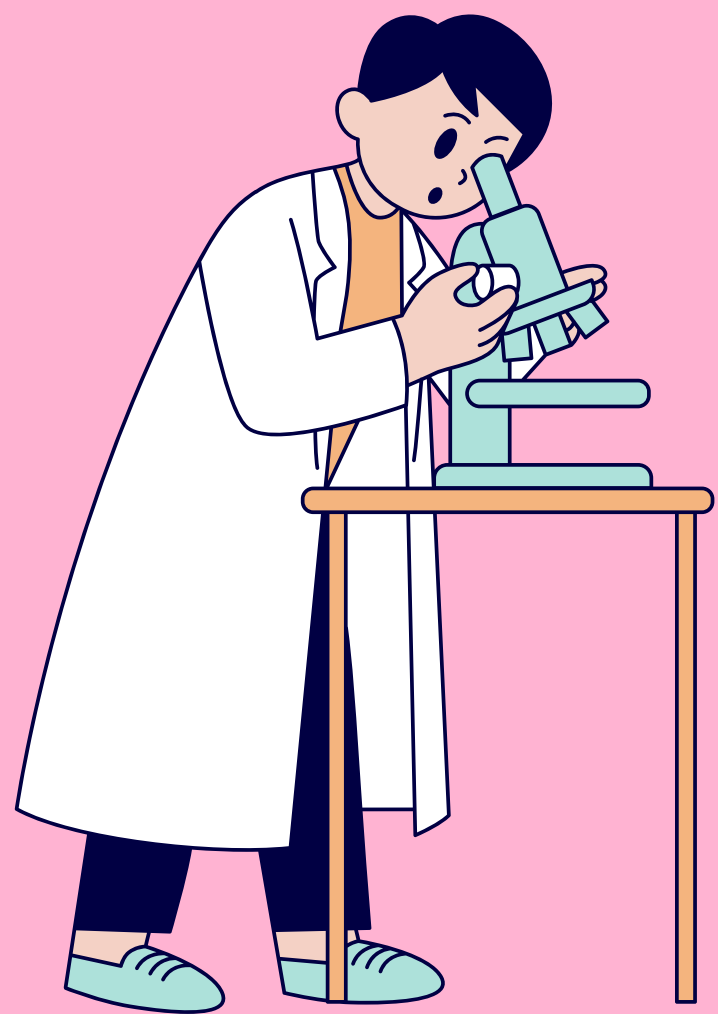
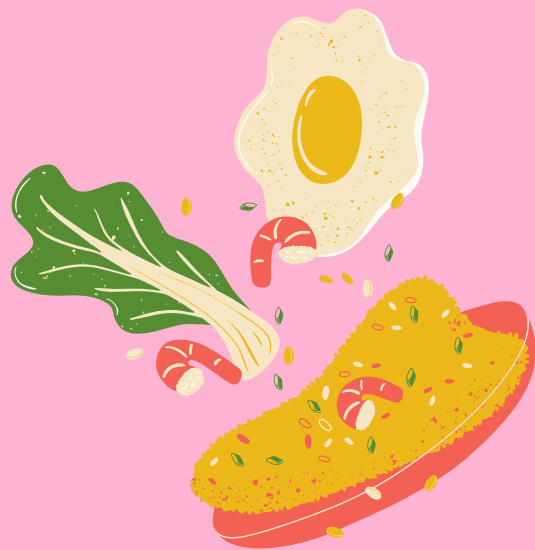
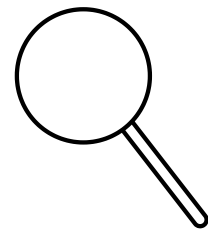
Type 2 diabetes is strongly associated with obesity and is a result of insulin resistance and insulin deficiency. Insulin resistance is a very common characteristic of type 2 diabetes in patients who are obese, and thus patients often have serum insulin concentrations that are higher than normal. However, some obese persons are unable to produce sufficient amounts of insulin, and thus the compensatory increase in response to increased blood glucose concentrations is inadequate, resulting in hyperglycemia. If blood glucose concentration is increased to a similar level in a healthy person and in an obese person, the healthy person will secrete more insulin than the obese person.

Treatment

1. Diet and exercise
2. Insulin therapies
3. Drugs used control blood glucose levels [2 and 3 please consult a medical professional's first]



PATHOLOGY



What is Diabetic retinopathy (DR)

: Diabetic retinopathy is a complication of diabetes, caused due to prolonged high blood sugar levels damaging the back of the eye or retina, an essential part of the eye that enables vision. It can eventually cause blindness if left undiagnosed or untreated. In addition, diabetes also increases the risk of other serious vision problems, such as glaucoma and cataracts. Diabetic retinopathy involves the growth of abnormal blood vessels in the retina. Over time, excessive sugar in the blood can cause the blockage of the tiny blood vessels that nourish the retina, resulting in cutting off its blood supply. To naturally compensate, the eye attempts to grow new blood vessels. However, these new blood vessels do not develop properly, leading some undesired consequences on the retina. Regarding disease severity, there are two types of diabetic retinopathy

PATHOLOGY

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1. Nonproliferative diabetic retinopathy (NPDR)

: During early stage of diabetic retinopathy, the walls of blood vessels in the retina are weakened. Tiny bulges in the blood vessels, known as microaneurysms, protrude from the walls of the smaller vessels and may leak fluid and blood into the retina. This leakage can cause swelling of the macula. In some cases, retinal blood vessel damages might lead to a buildup of fluid or edema in the macula. If macular edema develops, it often causes impaired vision. In case of severe blockage or occlusion, muscular ischemia can further exhibit, potentially leading to complete vision loss.

2. Proliferative diabetic retinopathy (PDR)

: As an advanced form of diabetic retinopathy, damaged blood vessels become completely occluded, causing the growth of abnormal blood vessels in the retina. These newly formed blood vessels are fragile and susceptible to leak into vitreous —the jellylike substance that fills the center of the eye. Eventually, scar tissue, as the result of the growth of these new blood vessels, can cause the retina to detach from the back of the eye. Retinal detachment affects vision by causing blurred vision or darkness or curtain-like images in the vision. If not treated, it can lead to blindness.



SUGGESTIONS FOR GIVING ADVICE



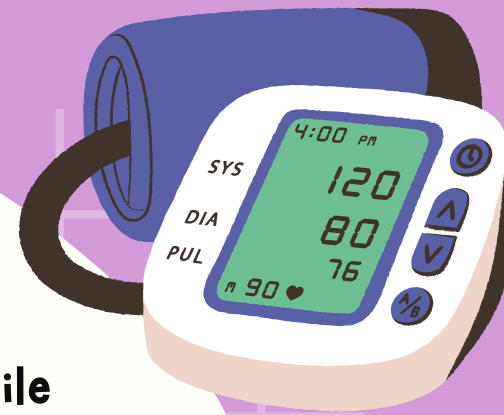
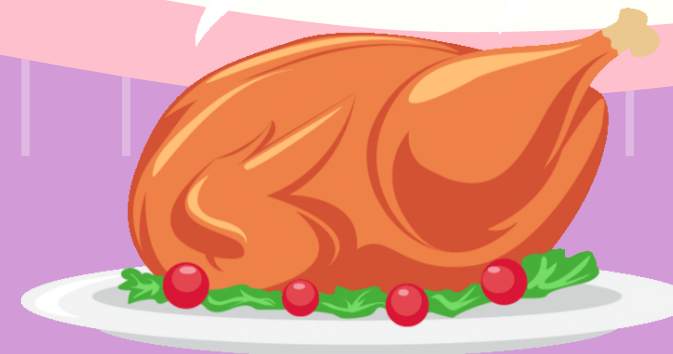
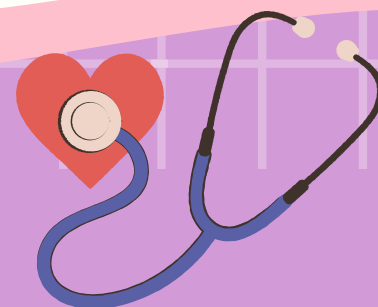
SUGGESTIONS FOR GIVING ADVICE

Healthy eating tips can help diabetic patients to efficiently manage blood sugar level and control body weight while reducing the risks of developing other health-related issues. These tips include:

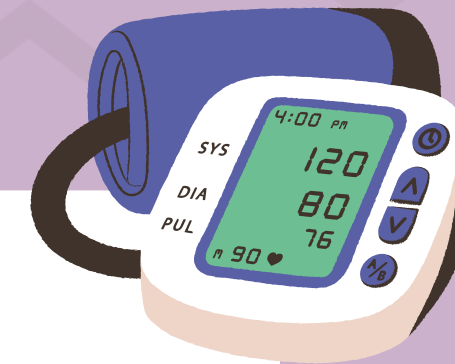
- **Limit amount of carbohydrates:** Appropriate amount of carbohydrates each day should be taken. Sources of carbohydrates are, for instance, rice, flour, bread and toast, noodles, rice, vermicelli, corn, taro, cassava, fruits and beverage.

- **Choose complex carbohydrates:** Choose the healthier foods that contain healthy carbohydrates and be aware of portion sizes. Complex carbohydrates made up of sugar molecules in complex chains provide vitamins, minerals and fiber. Complex carbohydrates are found in brown rice, whole grains and vegetables. However, starchy vegetables such as pumpkin should be consumed in proper amounts.

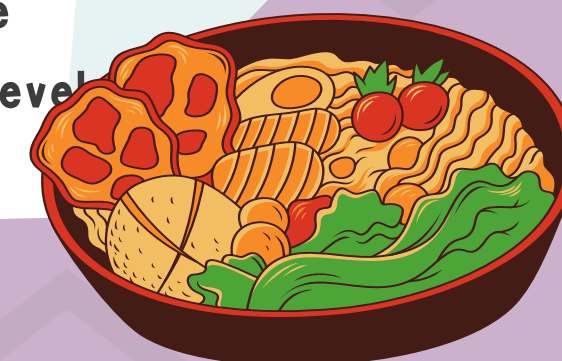
- **Stay within the recommended allowance for fruit per day:** All fruits contain a natural sugar, called fructose. Current nutrition guidelines recommend that diabetic patient should consume 3–4 servings of fruit per day, as part of a healthy eating pattern. Examples of 1 serving of fruit are: 1 small apple, 1/2 large banana, and 6 bite-sized pieces of melons.



SUGGESTIONS FOR GIVING ADVICE



- **Refrain from all fruit juices:** Fruit juices contain no fiber, but instead a large amount of sugar which quickly raises blood sugar levels. Therefore people with diabetes are usually best to avoid drinking fruit juices. Fruits with low glycemic index are advised in diabetic patients.
- **Avoid sweets and desserts:** Sweets and desserts are comprised of sugar which is quickly absorbed into blood circulation causing blood sugar spikes.
- **Limit sugar-sweetened beverages:** soft drinks, iced tea, fermented milk non-nutritive sweeteners are recommended, such as aspartame, saccharin, sucralose or stevia instead of white or brown sugar.
- **Limit alcohol intake:** Alcohol may raise blood sugar levels. If alcohol is consumed, it should only be consumed in moderation – up to 1 drink per day for women and 2 drinks per day for men. In addition, drinking alcohol with an empty stomach must be avoided since much of the alcohol passes quickly from the stomach into the small intestine, causing low blood sugar levels.





Savory food

ອາກາສາວ



BREAKFAST



fish porridge

How to cook :

1. Simmer the soup with coriander roots, garlic, dried shrimps and dried squid.
2. Use salt, soy sauce and good taste.
3. Simmer over low heat until the squid and prawns are tender.
4. Set up a pot of boiling rice, using jasmine rice, the rubber will thicken and heat until the rice grains bloom.
5. And then pour the water Wash off the rubber to keep the steamed rice grains intact. and the soup is clear and not opaque

ingredient :

- Fish fillet 100 gram (96 Kcal)
- Garlic 5 gram (8.34Kcal)
- water 1 liter (0 Kcal)
- low sodium fish sauce 2.5 gram (7.2 Kcal)
- Knorr Pork Cube Soup 20 gram (30 Kcal)
- rice 1 bowl (230 Kcal)
- sliced spring onion 2 gram (30 Kcal)

Lunch



STIR FRIED BROCCOLI WITH SHRIMP

How to cook :

1. Peel the broccoli skin. Choose only the stalks, turn diagonally.
2. Heat a wok over high heat, add vegetable oil, add minced garlic. Spread it back and forth 3-4 times. Followed by broccoli, fresh mushrooms.
3. Add soup, season with oyster sauce, white soy sauce, stir together and turn off the heat.

ingredient :

- broccoli 100g (36kcal)
- shiitak 50g (17 kcal)
- garlic 3g (5kcal)
- Plain water 100g (0kcal)
- low sodium Fish Sauce 2.5g (7.2 kcal)
- Sugar 1teaspoon (19 kcal)
- clan sauce 1tables (18kcal)
- Seasoning powdeg1 teaspoon (7.5 kcal)
- cooked rice1ladle (80kcal)

Dinner



STEAMED FISH WITH STEAMED VEGETABLES

How to cook :

1. Remove scales, gut, clean, chevron the body and stuff with kaffir lime leaves, galangal, and lemongrass
2. Place the fish on a plate that will be steamed. Arrange cabbage, yard long beans, carrots around the fish.
3. Steam the fish and vegetables for about 20 – 30 minutes until well cooked.
4. to be cooked Make the dipping sauce by roasting chilies, onions, garlic and black tomatoes in a pan until charred.
5. Pound chili, onion, and garlic together well. Put the tomato paste together.
6. Season with salt, fish sauce, sugar and salt. Taste to get the right taste.

ingredient :

Thai spicy sauce

- tilapia 100g (96 kcal)
- vegetable 1ladle (80 kcal)
- Dok khae 30g (9.6 kcal)
- bringal 50g (9 kcal)
- bell pepper 20g (5.4kcal)
- garlic 5g (8.34 kcal)
- tomato 15g (2.7 kcal)
- lemon 2g (0.28 kcal)
- low sodiam fish sauce 2.3g (7.2 kcal)

SWEET FOOD



**HOMEMADE SORBET
ICE CREAM (266 KCAL)**

Ingredients

- Chopper Blender
- Plastic box with lid and can freeze
- Colander
- Dutch Mill Delight curd, low-fat formula, small bottle 180 ml. Energy (80 kcal)
- Duchy yogurt FAT-FREE Coconut jelly flavor provides (80 kcal)

Anyone can use other flavors as they like.

- 100g Fuji apples provide (52 kcal)
- 50g fresh strawberries provide (16 kcal)
- 50g fresh blueberries provide (28 kcal)
- Half a lime (10 kcal)
- 1/4 teaspoon salt.

How to cook :

1. Cut the fruit into small pieces in a blender.
2. Add curd and yogurt.
3. Add lemon juice, and add aroma and sourness.
4. Add salt and blend everything well.
5. Filter and remove the seeds. - Soak for 4-5 hours. - Serve and fill your face with fruit.

Ingredients

- 1 egg (72 kcal)
- 1/2 cup ground oatmeal (75 kcal)
- 1/2 cup almond milk (15.2 kcal)
- 1/2 banana (50 kcal)
- Raisins

How to cook :

1. Mash the bananas thoroughly.
2. Add eggs, almond milk, and oatmeal, and mix well.
3. Heat a frying pan over low heat, brush with a little butter or oil, then pour the mixture into the pan



**OATMEAL
PANCAKES
(212.2 KCAL)**



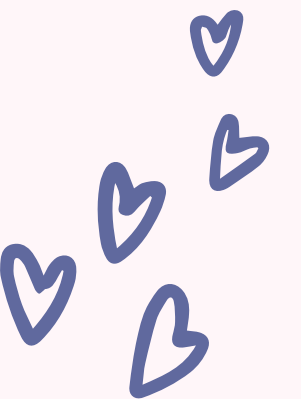
SWEET MILK PUDDING AND FRUITS SALAD (187 KCAL)

How to cook :

Ingredients ;

- 500g almond milk.(20 kcal)
- 4 grams of agar powder.(5.4 kcal)
- 1/4 slow spoonful stevia sugar.
- 1/4 apples fruit. (52 kcal)
- 1/4 guava. (43 kcal)
- 1/4 Dragon fruit. (kcal)

1. Put almond milk in a pot, followed by agar powder and stevia sugar, stir well.
2. Once it boils, filter it.
3. Cool in a cup and set it in a normal refrigerator for about 30 minutes.
4. Take the set of chrysanthemum and place apples, guavas, dragon glass on top.



Snack



FRESH MILK PUDDING, APPLE SALAD (170 KCAL)

Ingredients

- 250 ml of skimmed whole milk. Provides (88 kcal)
- 1 sheet of gelatin provides (8 kcal) .
- 1 pandan leaf
- 1/2 teaspoon of Lite Sugar provides (15 kcal)
- Glass cup

Part of fresh milk pudding

1. Soak the gellatin sheet in room temperature water.
2. Put the skimmed milk in a pot and put it on fire. With pandan leaves that are torn into pieces (crumple to create a smell)
3. Add soft gelatin and stir well. Wait until it boils softly. Wait for general people
4. When foaming, lift it down. Then stir to release the heat for about 1 minute.
5. Add Lite Sugar, stir until dissolved. Filter with a colander frequently, put in a glass cup and leave to cool a little and put in the refrigerator and let it rest for 3-4 hours.

Apple Salad

Ingredients

- 30 grams of green apples provide (16 kcal).
- 30 grams of red apples provide (18 kcal)
- 30 grams of Fuji apples provide (10 kcal).
- 1/2 teaspoon of Lite Sugar provides (15 kcal).
- a pinch of salt

Apple Salad

1. Dice the apples, add to a mixing cup, add a pinch of salt so that the apples do not change color.

2. Add Lite sugar, squeeze lemon, mix gently, then cover with plastic wrap to store in the refrigerator to wait for the pudding to set.

Time Served Put the pudding in a cup, fill it with skimmed whole milk and drizzle with the prepared apple salad.



**Little candied fruit salad
(209 kcal)**

Salad Dressing

Ingredients ;

- 2 tablespoons lemon juice
- 1 tangerine squeezed
- 1 tablespoon mustard
- 1/8 teaspoon salt
- 1/8 teaspoon ground black pepper
- 2 tablespoons olive oil

Selected Fruits

Ingredients ;

- 50g avocado 80kcal
- 100 grams of apple 52 kcal
- 100 grams of kiwi 60 kcal

How to cook :

1. Put everything together, beat with a whisk or put everything in the electric blender bowl. Blend enough and pour into a bowl.
2. Pour over the prepared fresh fruit. Eat immediately. (If you want to store it in the refrigerator, it should not last more than 3 days.)

MEMBER

1. Ploypailin Srauram	65122230002
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3. Sasina Suanket	65122240025
4. Thanchanok Kladpet	65122230131
5. Thitiporn Kanyon	65122230035
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7. Thanrada Chaiyajan	65122230063
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