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THE NEW NORMAL : Creating a Pleasant Virtual Communication

## Chalek Juice: An alternative diet therapy of diabetes mellitus

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Diabetes mellitus (DM) is a chronic disease caused by insufficient amounts of insulin due to the malfunction of pancreatic organ (Ministry of Health of Republic of Indonesia, 2019; Arsono, 2005). It will impact productivity, thereby reducing the quality of human resources. Indonesia is among the 10 largest countries in the world with DM cases and is ranked 4th (Damayanti, 2015; Ministry of Health of Republic of Indonesia, 2018; Irawan, 2010). Health treatment for DM requires expensive costs, especially for patients with complications. This encourages some people to look for herbal therapy, such as bitter melon (*Momordica charantia L*) (Ministry of Health of Republic of Indonesia, 2014; Katmo and Pramono, 2006).



**Figure 1 Bitter Melon (*Momordica charantia L*)**

Shown in Figure 1, Bitter Melon or known in Indonesia as Pare, contains saponins, flavonoids, polyphenols, and alkaloids, which may improve pancreatic beta cells, thereby increasing insulin production (Suiraoaka, 2012). Besides, bitter melon also contains charantin, an active antidiabetic substance that is believed to reduce blood sugar levels in the body. The decrease in blood sugar level is marked by lectin, carbohydrate-binding proteins expressed on the surface of the body's cells (Martínez-Alarcón et al., 2018; Tandra, 2013). This prompted the authors to create an alternative diet therapy formula named Chalek Juice, which stands for Charantin and Lectin.



**Figure 2. Chalek Juice made from a mixture of bitter melon, cucumber, green apple and lemon)**

As the name implies, bitter melon is dominated by bitter taste. It is mixed with cucumber, green apple and lemon to get a fresh and less bitter taste. To make Chalek Juice, there are six steps. First, wash the fruits and vegetables followed by cutting them into small pieces. To reduce the bitterness, soak the bitter melon into salt water for about 10 minutes (Setiawan, 1993; Rukmana, 2006), as shown in Figure 3.



**Figure 3 Soaking process of bitter melon into salt water to reduce the bitterness**

The bitter melon, cucumber and green apple are crushed separately using a food processor. Before mixing all the ingredients, bitter melon, cucumber and green apple are strained from their pulps. To get a glass of Chalek Juice (250 mL), mix 120 mL of bitter melon, 60 mL of green apple, 60 mL of cucumber and 20 mL of lemon juice, and mix it (Figure 4). Finally, the Chalek Juice is ready to drink. It is highly recommended to drink it at night before going to bed.



**Figure 4. Mixing all ingredients**

A glass of Chalek juice contains 106 calories, 19.6 grams of carbohydrates, 4.1 grams of protein, 2.9 grams of fat, 2.4 grams of fiber, 60 mg of calcium and 42 mg of sodium. All ingredients used in the juice making are affordable and very easy to find at markets or convenient stores.



**Figure 5. Blood sugar level testing after two hours of consuming chalek juice**

In addition, bitter melon likely increases beta-cells or cells in the pancreas that function to produce insulin in the pancreas, and it is believed to help insulin secretion. This makes bitter melon often associated with diabetes (Fuangchan et al., 2011). As shown in Figure 5, we measured the blood sugar level in the participants after 2 hours consuming Chalek Juice. Hasibuan and Manurung (2020) state that bitter melon juice was significantly effective in reducing blood sugar levels in patients with Type II diabetes mellitus ( $p = 0.000$ ). However, a research by Gardiarini et al. (2018) using the hedonic test of the taste panel found that most of the panelists favored and really favored the bitter melon food (sautéed bitter melon) provided by the hospital. It is suggested, this innovation still needs to be improved in the future, especially its durability. This study found Chalek Juice only lasts a maximum of one week at cold temperatures and 30 minutes at a room temperature.

### **Consent**

The informants (identifiable) have given their consent for their pictures to be used in the publication of this research.

## Conflict of Interest

None.

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