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### Formulation and Evaluation of Herbal Gummies for Weight Management

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#### ABSTRACT

Never is losing weight simple. For a faster rate of body fat burning, you must combine the proper amount of activity with a healthy diet. You can easily choose any delectable weight loss gummies to burn your body fat if you're preparing to take weight reduction pills. These candies are created from a variety of organic nutrients that are well-known for boosting metabolism and keeping you healthy. Another great option to aid in quick weight loss is these tasty weight loss gummies. These gummies are primarily made from herbal extract, which is well-known to be an effective weight loss supplement. No matter what kind of diet you follow, you may easily eat these gummies because they don't contain sugar, gluten, or gelatin. These gummies can simply improve your metabolism to increase your overall energy levels while reducing extra water weight, bloating, and body fat. These weight loss gummies can be a great additional alternative to think about for quickly losing excess fat. These gummies are made from the extracts of turmeric, coriander, ginger, guava, coconut oil, honey, gelatin powder and sugar These all-natural substances will assist your metabolism speed up and accelerate the burning of stored body fat.

**Keywords:** Gummies, Obesity, weight lose, natural substances

#### INTRODUCTION

Over the past few years, obesity has become more and more common in the United States. According to the National Health and Nutrition Examination Survey (NHANES) for the 2007–2008 year, persons with a body mass index (BMI) 30 kg/m<sup>2</sup> were more than 30% more likely to be obese, and both men and women were almost 70% more likely to be overweight or obese (BMI 25 kg/m<sup>2</sup>). Every ten years, the prevalence of obesity has risen, according to the pattern during the past 20 years<sup>[1]</sup>. Additionally, as compared to people who have normal weight, the cost of healthcare for obese patients is about 42% greater<sup>[2]</sup>. The promise of dietary supplements for weight loss is that they will help people lose weight more quickly and easily than through calorie restriction and increased activity. These products continue to be a desirable substitute for or addition to weight

management, despite issues with efficacy and safety<sup>[3, 4]</sup>. According to a national poll conducted in 2008, 33.9% of persons who have tried to lose weight have done so using dietary supplements. Additionally, it was discovered that the usage was more prevalent among women, younger adults, minorities, people with lower incomes and levels of education<sup>[5]</sup>. Patients may choose dietary supplements because they believe they are "natural" and possibly safer than prescription drugs. Additionally, patients frequently do not see a need for medical aid. These alternative therapies may potentially be a replacement for earlier unsuccessful attempts using conventional methods<sup>[6]</sup>. Despite their extensive usage, the safety and effectiveness of the products currently available are still the subject of scant research. Dietary supplements are not subject to FDA regulation because they are thought of as food rather than pharmaceuticals (FDA)<sup>[7]</sup>. Instead, dietary supplements may be promoted without proof of their efficacy

and safety under the Dietary Supplement Health and Education Act (DSHEA).

Modes:0 dietary supplements can be marketed without evidence to support efficacy and safety. If a dietary supplement appears to be unsafe after being marketed, the FDA can then decide whether or not to have the product removed from the market. This was the case for the weight loss supplement ephedra which was removed from the market in 2004 after reports of serious health risks<sup>[8]</sup>. The literature published in the arena of weight loss continues to be plagued by concerns such as: small studies, inconsistency with participant body weight (BMI), variation in length of studies, use of exercise, and a variety of products at differing dosages. Without sufficient proof of their usefulness and safety, dietary supplements may be advertised. The FDA has the authority to order the recall of a dietary supplement if it turns out to be dangerous after it has been promoted. In this instance, ephedra, a weight-loss product, was taken off the market in 2004 due to concerns of major health dangers<sup>[9]</sup>. Small studies, participant body weight (BMI) inconsistencies, study length variations, the use of exercise, and a range of products at different dosages continue to be problems in the literature produced in the field of weight loss<sup>[10]</sup>.

### **Obesity**

A condition marked by excessive body fat that raises the danger of health issues. Taking in more calories than you burn via exercise and everyday activities is a common cause of obesity. A condition known as obesity involves having too much body fat. Obesity is more than simply a visual issue. It is a medical condition that raises the chance of various illnesses and conditions, including heart disease, diabetes, high blood pressure, and some malignancies.

There are numerous causes why some people struggle to lose weight. Obesity typically develops from a combination of dietary, physiological, and environmental factors along with exercise, physical activity, and lifestyle choices. The good news is that even a small amount of weight loss can help or even stop the health issues linked to obesity. You can lose weight by changing your habits, increasing your physical activity, and eating healthier. Additional alternatives for managing obesity include prescription drugs and weight-loss techniques.

### **Symptoms**

Obesity is frequently identified using the body mass index (BMI). For the BMI formula, multiply the weight in pounds by 703, and then divide the result by the height in inches. Or multiply the weight in kilos by the square of the height in meters.

### **BMI Weight status**

Below 18.5- Underweight  
18.5-24.9 - Normal  
25.0-29.9 - Overweight  
30.0 $\geq$  - Obesity

### **Ingredients used**

#### **Turmeric**

The root of the *Curcuma longa* plant is where the popular spice turmeric is derived. It has a substance called curcumin,

which could possibly lessen swelling. Curry powders, mustards, butters, and cheeses are typically flavoured or coloured with turmeric, which has a warm, bitter taste. Turmeric is frequently used to treat diseases that involve pain and inflammation because curcumin and other substances in it may reduce swelling. Turmeric is frequently used by people with osteoarthritis.

**Uses:** It soothes digestion, amps up fat burning, enhances immune function, improves skin complexion, supports strong bones, joint mobility and stiffness, promotes healthy blood pressure levels and improves circulation health.

#### **Ginger**

The generic term for ginger is Zingiber, which is derived from the Sanskrit word singabera for the spice. Since ancient times, ginger has been used in India and China, and by the first century CE, traders had brought ginger to the Mediterranean region. In England, it was well recognized by the 11th century. Soon after the conquest, the Spaniards introduced it to Mexico and the West Indies, and by 1547, Santiago, Chile, was exporting ginger to Spain.

**Uses:** improves immunity, alleviates PMS symptoms, relieves nausea and upset stomach, may help with cancer, reduces pain, healthier skin, weight loss aid.

#### **Guava leaves**

Guava leaves typically measure 7 to 15 centimetres long and 3 to 5 centimetres wide and are oblong to oval in shape. The arrangement of the leaves is opposite, meaning that two leaves develop at the same time on either side of the stem. The leaves also have short petioles, or stalks, which connect them to the stem. The deep green Guava leaf has a broad, leathery surface with occasional light brown areas and hardly visible white veins. When crushed, guava leaves release an aroma that is reminiscent of the guava fruit. A little tree with widely spreading branches and copper-colored bark that peels off to reveal a green base bears guava leaves.

**Uses:** Guava helps boost your immunity, may reduce the risk of developing cancer, helps to manage blood sugar levels, guavas help in keeping your heart healthy, helps during constipation, helps in better eyesight, guava is an anti-stress agent, guava helps women during pregnancy.

#### **Coriander**

The spherical, tan-colored seeds of the coriander plant (*Coriandrum sativum*), a member of the parsley family, are used to make the spice coriander. The entire plant—leaves, stalks, seeds, and all—can be referred to as coriander. Yet, the majority of people refer to the spice made from the plant's seeds when they use the word coriander. The name cilantro, which derives from the Spanish term for coriander or Chinese parsley, is frequently used to refer to the plant's leaves. Moreover, coriander roots are used in cooking as a flavorful component to Thai curries. All around the world, including Europe, Asia, Africa, and the Americas, coriander is a natural plant.

**Uses:** May help lower blood sugar, rich in immune-boosting antioxidants, may benefit heart health, may protect brain health, may promote digestion and gut health, may fight infections, may protect your skin, easy to add to your diet.

### **Honey**

Honey is a delicious, thick liquid meal with a dark golden colour that is made by different bee species from the nectar of flowers. The nectar's flavour and colour are dictated by the flowers from which it was collected. The domestic honeybee harvests clover to make some of the most sought-after commercial honeys. Honey can granulate between 50 and 65 °F (10 and 18 °C), is water soluble, and contains around 18% water. It is somewhat acidic, mildly antiseptic, and has been used to treat burns and abrasions. It is one of the foods that is most readily absorbed and is frequently used in baked goods, candies, prepared fruits, cereals, and pharmaceuticals. The ancients had almost no other options for sugar and revered honey for its therapeutic properties.

**Uses:** Healthy alternative to sugar, honey can replace sugar in baking, cooking and beverages, treating burns and wounds, honey can be used to treat burns and wounds, acne cure, immunity from pollen allergies, natural cough syrup, improves digestion, hair conditioning, lip balm.

### **Coconut Oil**

Coconut oil is edible oil made from the dried meat of the coconut and its fruit (*Cocos nucifera*). At 23 °C (74 °F), coconut oil melts into a yellowish-white solid or semiliquid. In contrast to the majority of other oils derived from plants or fish, coconut oil contains up to 90% saturated fat and only a small amount of unsaturated fatty acids. There is no cholesterol in it.

**Uses:** Protect your skin from UV rays, increase your metabolism, cook safely at high temperatures, improve your dental health, relieve skin irritation and eczema, improve brain function, make healthy mayonnaise, and moisturize your skin.

### **Gelatin Powder**

Gelatin is an animal protein with gel-forming qualities that is largely utilised in culinary goods and domestic cooking, but it also has many industrial applications. It is removed by boiling animal hides, skins, bones, and tissue after alkali or acid pretreatment from collagen, a protein present in animal skin and bone. It is a pure protein diet that is simple to digest, but it lacks some essential amino acids, making it a nutritionally inadequate protein. Unflavored, granulated gelatin has a colour range of pale yellow to amber and is essentially flavourless and odourless. Another form of gelatin is a finely pulverised mixture with sugar, flavouring, acids, and colouring added. While dry goods are kept at ambient temperature.

### **Methods of preparation**

Step 1: Juice the Guava leaves, coriander and ginger in a juicer.

Step 2: Add the Guava leaves, coriander and ginger juice to a small saucepan and heat on low to medium heat for 2 minutes. Add in the turmeric powder, turmeric, coconut oil, and honey. Heat for 5 minutes or until the coconut oil is melted.

Step 3: Remove the pan from the stove. Whisk in the gelatin powder until combined.

Step 4: Pour into a silicone mold or a small baking dish. Refrigerate for 2-3 hours, or until firm.

Step 5: Push out or slice gummies into squares and remove with a blunt knife. Store for 7-10 days in an airtight container.

### **Evaluation tests**

#### **pH of the gummies**

1. Making an invariant paste by blending gummies.
2. Before determining the pH value, calibrate the pH cadence and bring the sample temperature to room temperature before measuring the ph.
3. Spraying distilled water on the pH electrode.
4. Submerging the electrode in gummy paste and determining pH

#### **Gummy Texture**

1. Hardness: Compression test, which replicated the squeezing of gummy bears between the thumb and forefinger, measured hardness.
  - a. relating significant textural components of sticky confections through careful assessment.
  - b. Establishing upper and lower forbearance for the product using the hardness parameter.
2. Firmness- Resistance to contraction is the most popular method of gauging firmness. The stiffness is measured with a penetrometer.
3. Softness – The softness contrasts with stiffness, which is determined by the length of the bending. The opposite of firmness or hardness as determined by consistency tests is softness.
4. Springiness is calculated by dividing the original contraction distances by the height detected during the alternate contraction.

#### **Sensitive Evaluation**

- a. Acceptance standards: Test of paired comparison or ranking: The paired comparison test consists of giving examiners two samples and asking them to compare the two. without requiring a rating of the size of the difference, such as "Are the two samples the same or different? Instead, "Which of these two samples is sweeter?"
- b. Comparability testing An overall difference test called the Brace-Trio Test will show whether or not there is a sensitivity difference between the two samples. This approach is very beneficial for figuring out whether product variations are caused by modifications to the components, manufacturing, packaging, or storage.

#### **Texture evaluation**

We measure each group of samples three times concurrently while using the full texture test mode and the middle level of the sample.

#### **Design of gummies' packaging**

Gummies are typically packed in clear PET bottles with wide mouths to showcase the unique and pleasant vitamins they contain and to pique the interest of consumers. We provide packaging solutions in a range of colours and sizes, as well as custom label design services and bottle forms.

Contact us by phone or email if you have any questions regarding our services, and one of our team members will get back to you within three business days.

#### **Viscosity**

Jellies' viscosity was assessed using (VR 3000 MYR Viscometers) at 25°C and spindle number 7. A 50 g prepared

sample was placed within a viscosity spindle, which was revolved at 10 rpm.

### Texture evaluation

The (TA. XT Plus-Stable Micro Systems) texture analyzer was used to measure the mouth feel in terms of stiffness of jelly as well as its textural description. Using compression analysis, the texture profile analysis was carried out with probe P100 with parameters of 5 g trigger, 1.2 mm deformation, and 1.0 mm/s speed. The graph's maximum force value serves as a gauge of firmness.

## CONCLUSION

Many people prefer gummy vitamins over capsules because they are easier to swallow, taste better, and do not have an unusual smell. They may make people more likely to take vitamins regularly. Vitamin C is an essential part of skin health both as a small molecular weight antioxidant and as a critical factor for collagen conflation.

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