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FORMULATE AND STANDARDIZE THE PANCAKE USING SEEDS- A SENSORY ANALYSIS

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Abstract

Women who have PCOS condition have common ovulatory disturbance, ovulatory confusion, endometrial cancer, cardiovascular disease, dyslipidemia, type 2 diabetes, and infertility. The complex symptoms are an irregular menstrual cycle, elevated androgen levels, multiple ovarian cycles, obesity, hypertension, diabetes, and infertility. Intake of the seed helps to regulate the hormones of female menstruation. Nowadays, most of the girls in the age group above 13 are early to attain puberty. Some of them have the condition of PCOS in their early stages. Seed-based pancakes have emerged as a nutritious option, providing essential nutrients crucial for a balanced diet. Depending on the seeds chosen, these pancakes offer a diverse range of health benefits. For instance, sunflower seeds contribute to heart health due to their rich content of vitamin E and healthy fats. Flaxseeds provide omega-3 fatty acids essential for brain function and reducing inflammation. Sesame seeds offer calcium and other minerals important for bone health, while pumpkin seeds add protein and zinc, supporting immune function. This variety allows individuals to customize their pancakes to meet their specific nutritional needs and taste preferences, ensuring a wholesome and satisfying meal. Additionally, the ease of preparation makes seed-based pancakes a convenient breakfast option, especially during busy mornings when time is limited. Their versatility extends their appeal, providing a simple yet nourishing meal suitable for any time of day and dietary requirements. In the present investigation, pancakes were developed by using dry ingredients of seed flour (flaxseed, sunflower seed, pumpkin seed, and sesame seed), wheat flour, milk, jaggery, and water. Further, sensory evaluation tests are conducted to assess the acceptability. In conclusion, formulate and standardize the pancake using the seeds may help regulate hormonal balance in their bodies.

Keywords: *Seeds health benefits, PCOS, regulate hormones in the body.*

1. Introduction

Polycystic Ovary Syndrome (PCOS) is a common condition that impacts hormone levels in women during their reproductive years. Known for hormonal imbalances and genetic predispositions, PCOS displays various symptoms including irregular menstrual cycles, increased hair growth, pimples, and difficulties with fertility. A notable characteristic is the existence of small cysts or follicles on the ovaries (Lovekush Singh, 2023).

Excessive insulin and androgen production, alongside hereditary elements, contribute to PCOS. Elevation in male hormones can obstruct regular hormone synthesis and egg formation in the ovaries. Underlying causes encompass insulin irregularities, excessive androgen synthesis leading to pimples and excessive hair growth, and genetic associations (Sangeeta Adhikari, 2024).

PCOS affects 4–25% of women in their reproductive phase, with differing occurrence rates based on diagnostic standards and demographics studied. The Rotterdam criteria, endorsed by numerous international organizations, diagnose PCOS when two or more of the following situations arise: irregular menstruation or ovulatory dysfunction, clinical or biochemical signs of hyperandrogenism, and polycystic ovarian morphology on ultrasound (Alice Guarano, 2023).

PCOS is recognized as a condition shaped by genetic and environmental factors, leading to a variety of clinical and biochemical characteristics. Despite an unknown genetic source, a family history of PCOS is typical, hinting at a possible dominant autosomal pattern. However, formal segregation analysis is hampered by inadequate phenotypic information. Lifestyle factors like obesity, unhealthy eating habits, and sedentary behaviors can worsen PCOS signs, potentially compounded by exposure to toxins or infectious agents (Uche Anadu Ndefo, et.al., 2013).

The prevalence of PCOS globally varies significantly, estimated to be between 5.5% and 12.6% among women aged 17–45 years (Mahreen Begum, et.al.,2021). According to the WHO, approximately 116 million women worldwide are affected by PCOS, accounting for 3.4% of the total female population. Studies in India have shown a lack of awareness among girls (78.4%) and varying prevalence rates, such as 8.20% in Bhopal and 11.97% in Mumbai. Complications from PCOS affect around 15-20% of women of reproductive age worldwide, with many cases going undiagnosed due to insufficient awareness and guidance (Gupta,

et.al.,2017). Despite high prevalence and limited literature, there's a notable gap in understanding PCOS in Northeast India, particularly in Manipur (Jeena Wahengbam, et.al.,2022)

Flax or linseed (Linum usitatissimumL.) seeds, rich in omega- 3 adipose acids, serve as vital nutraceutical foods with-inflammatory, estrogenic, laxative, and antibacterial parcels. Consuming flaxseeds aids in precluding and managing colored health conditions, including cardiovascular complaint, neurodegenerative conditions, rotundity, diabetes mellitus, polycystic ovary pattern, gout, liver and order dysfunction, oxidative stress- related conditions, postmenopausal symptoms, osteoporosis, perverse bowel pattern, dry eye complaint, cystic fibrosis, diarrhea, and cancers, particularly of the mammary and prostate glands. Flaxseed mean truly useful. The input of flax lignan that helps to reduce the trouble of PCOS in susceptible women as lignan binds with free circulating testosterone and excreted by biliary system (C. Manimurugan, et.al.,2023)

Pumpkin seeds oil is enriched with nutraceutical ingredients such as palmitic acid, oleic acid, stearic acid, and linoleic acid, belonging to the omega-3 or omega-6 categories, crucial for various metabolic pathways. Additionally, it contains vitamin E, including alpha-tocopherol and gamma-tocopherol, which exhibit beneficial health properties. These components contribute to the incredible nutritional activities associated with pumpkin seeds. Estrogen hormones play vital roles in the body, including regulating the menstrual cycle, reproduction, bone density, and cholesterol metabolism. Phytoestrogens, found in plants, mimic mammalian estrogenic properties by binding to estrogen receptors. Pumpkin seeds oil has been found to contain a high percentage of phytoestrogens and sterols and health benefits. (Maria Aslam, et., al 2021).

Sunflower seeds boast a rich concentration of two essential micronutrients: vitamin E and selenium. Vitamin E plays a pivotal role in enhancing progesterone production, while selenium aids in detoxifying excess estrogen from the liver. On the other hand, sesame seeds offer significant benefits for postmenopausal women by enhancing blood lipids, antioxidants, and sex hormones, (Deeptimayee Mahapatra, et.al.,2023)

Sesame seeds, rich in dietary fiber, protein, vitamins (A, D, E, C, B6), minerals (zinc, selenium), copper, manganese, calcium, and magnesium, offer numerous health benefits. They aid in preventing diabetes, shielding DNA from radiation damage, reducing aging symptoms, promoting digestion, enhancing oral health, and lowering the risk of cardiovascular disease. The nutrient profiles are crucial for immunity. Black sesame inhibits myocardial remodeling, prevents atherosclerosis, and lowers total cholesterol (TC), low-density lipoprotein (LDL) levels, and blood lipids. Additionally, it reduces antioxidant stress, preventing cell damage and inflammation. Sesame is beneficial for late complications of PCOS, addressing lipid imbalance, CVDs, and bone resorption. With low carbohydrate content, sesame seeds help manage insulin levels and hormonal disorders, making them effective in PCOS treatment. The herbal extract of sesame aids in regulating blood glucose levels and supports weight loss. (Maria Aslam, et.al,2021)

2. MATERIALS AND METHODS

2.1 Materials

2.1.1 Raw materials

Raw materials such as flaxseed, sunflower seed, pumpkin seed, sesame seed, wheat flour, palm jaggery, and butter were purchased from local market of Chennai.

2.2 Methodology

Roast 10 grams of each seed (flax, pumpkin, sesame, and sunflower) and grinded coarsely in a mixer. In a bowl, mix 20g of wheat flour and 40g of ground seed flour. Kept it aside. In a saucepan, slowly heat milk over low to medium-low heat on the stovetop, steam it slightly not to boiled it. In a separate bowl, combine 15g of jaggery with the dry ingredients and add 15 ml of milk and 10 ml of water. Mixed it well until the batter become thin. In the heat pan add few drops of ghee or butter and pour the batter in small round shape and kept the flame on low medium. Once the bottom of the batter become golden flip it in another side. And make it allow cook on another side. Once it become brown color take it out from the pan and to serve the pancake.

Table 1. Formulation of pancake

Ingredients	Sample weight(g)
Seed flour (flax, sunflower, sesame and pumpkin)	40
Wheat flour	20
Milk	15
Water	10
Jaggery	15

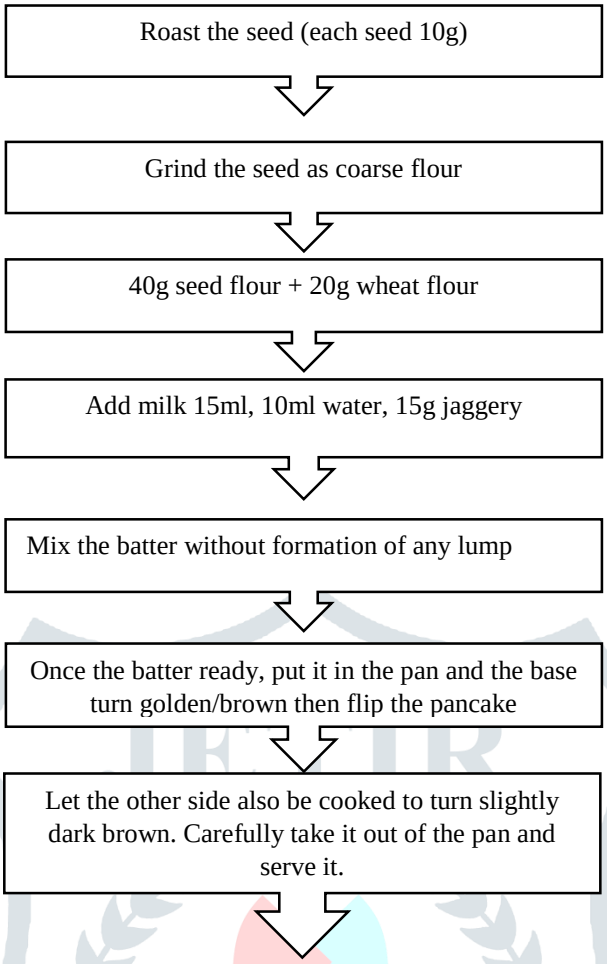


Figure 1. Process flow sheet for preparation of pancake

Figure 2. Image of pancake

2.2.1 Sensory analysis

The sensory analysis of the pancake was conducted using a 9-point hedonic scale with fifty untrained participants. This method aimed to evaluate the overall liking of pancake based on appearance, taste, texture, aroma, and overall acceptability.

2.2.2 Statistical analysis:

The sensory analysis data was subjected to statistical analysis utilizing disruptive statistics, focusing on mean and standard deviation. And this was done using Microsoft excel.

3. RESULT AND DISCUSSION:

3.1 Organoleptic characteristics of pancake

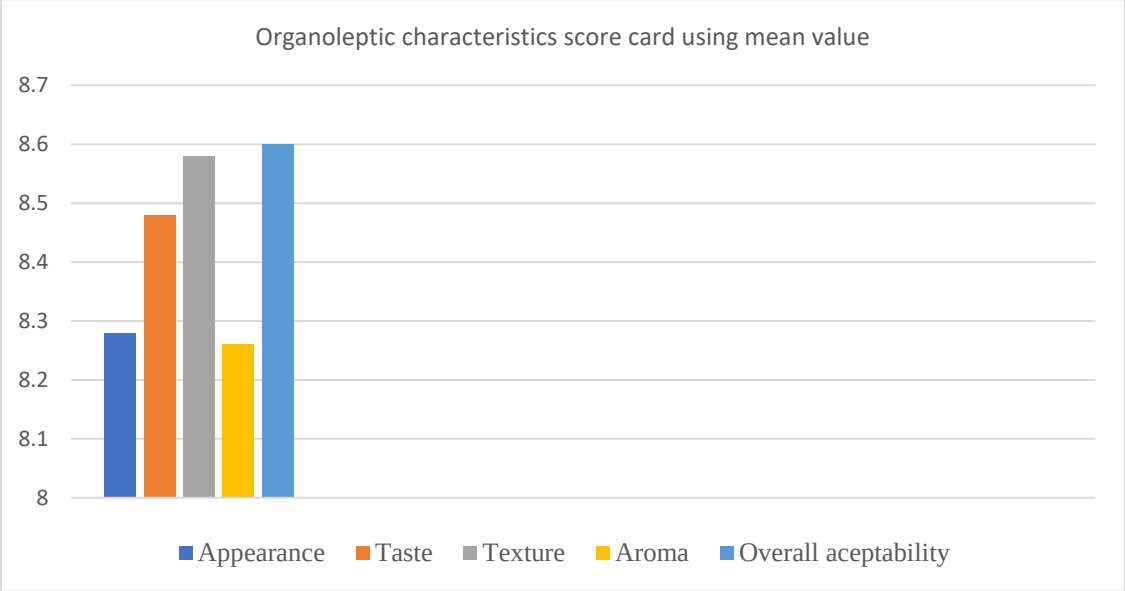
Data on organoleptic characteristics viz, appearance, taste, texture, aroma and overall acceptability of pancake illustrated in Table 2 concentration on average sensory score of developed pancakes.

The organoleptic characteristics, including appearance, taste, texture, aroma and overall acceptability, were evaluated for nutrient-dense pancake sample received scores 8.28 for appearance, 8.48 for taste, 8.58 for aroma, 8.26 for texture and 8.6 for overall acceptance.

Table 2. Organoleptic characteristics evaluated by mean and standard value

Appearance	Taste	Texture	Aroma	Overall acceptability
8.28 ±0.92	8.48 ±0.76	8.58 ±0.64	8.26 ±0.92	8.6 ±0.57

Table 3. Score card of organoleptic characteristics of pancake



4. CONCLUSION

Incorporating a blend of nutrient-rich seeds like sunflower, flaxseeds, sesame, and pumpkin seeds, the pancake aims to provide a wholesome and satisfy option. Renowned for their rich sources of fiber, healthy fats, and essential nutrients, these seeds potentially aid in managing PCOS symptoms. This convenient and delicious choice for breakfast or snacks aligns with dietary recommendations for PCOS management, promoting overall health and well-being in individuals with this condition. Continuing research and innovation in this area will further enhance the efficacy and acceptance of seed-based pancakes among women and consumers alike, fostering a healthier in their daily lives.

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