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Research Article

Nurturing Hormones: The Role Of Fortified Noodles In Adolescent Health

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ABSTRACT

The purpose of this study is to determine whether hormonal abnormalities in teenage girls may be treated with specially prepared, nutrient-rich noodles. Dietary remedies are desperately needed, as hormones play a critical role in controlling physiological processes and hormonal diseases such polycystic ovarian syndrome (PCOS) are common in young women. The goal of the research is to create a noodle dish with components that are recognized for their ability to balance hormones. The usefulness of these noodles in preserving hormonal balance is assessed in the study, which highlights the significance of providing teens with easily accessible, handy, and nourishing dietary options. According to preliminary findings, a dietary intervention consisting of these fortified noodles may be a feasible means of enhancing the hormonal well-being of teenage girls.

INTRODUCTION

The thyroid gland and its hormones have a variety of roles in the development of organs and the homeostatic regulation of fundamental physiological processes such as body growth and energy consumption in all vertebrates. From this angle, the thyroid differs from other major endocrine glands because thyroid follicular and exocrine cells are identical in many respects. Thyroid-stimulating hormone (TSH), often referred to as thyrotropin, is produced by the

pituitary gland and serves as the main regulator of thyroid growth and function from late fetal development to adulthood [1]. The body uses hormones as chemical messengers. Through the blood, they deliver essential information to the cells. Hormones typically bind to cells through receptors. They are produced by the endocrine glands and are transported to different tissues and organs by the circulation. Each hormone has a unique purpose and delivers a crucial message to

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particular bodily components. Melatonin, for instance, is produced and released by the pineal gland [2]. Women are susceptible than men to face such differences. Changes in hormone results become evident during menopause, pregnancy, and the menstrual cycle. Sometimes drugs used to treat certain disorders can interfere with or disturb the production and secretion of hormones [3]. In addition to anovulation and polycystic ovaries, polycystic ovarian syndrome, or PCOS, can also cause insulin resistance, dyslipidemia, hirsutism, hyperandrogenism, insulin resistance, and/or infertility. Despite being extremely common in the general population—between 4 and 20% of women of reproductive age affected—PCOS is still not considered a serious health concern. Hormonal imbalance is the term used to describe an irregularity in the body's manufacture, distribution, or functioning of hormones. Hormones are chemical messengers that regulate a

number of physiological processes, including growth and development, metabolism, stress response, mood, and mood disorders. [4]. Improper production or regulation of these hormones can lead to a variety of symptoms and health issues. Normal ovulating ovaries include follicles, which are sacs filled with fluid that vary in size from 1 to 30 mm based on the menstrual cycle phase. Each follicle, or sac, contains a little egg that never matures to the point where it triggers ovulation. The polycystic ovary has about 12 microscopic follicles, with diameters ranging from 2 to 9 mm. These follicles are frequently arranged in a "pearl-necklace" pattern around the ovary's periphery. Thus, as the name suggests, poly means numerous and does not require surgical removal. Polycystic ovarian syndrome is characterized by a high number of microscopic fluid-filled cyst-like sacs that grow inside the ovaries[5].

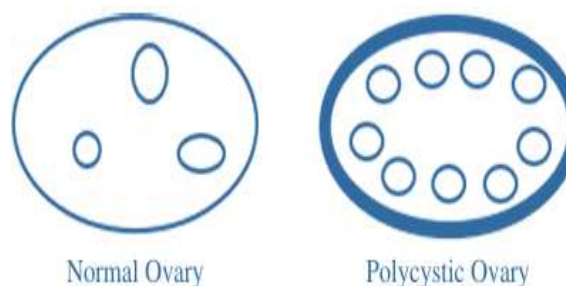


Fig no 1: Polycystic ovary

HISTORY

Although descriptions of polycystic ovaries date back to the 19th century, it wasn't until 1935 that the syndrome was recognized and given its name in honor of Stein and Leventhal. These two individuals were the first to link polycystic ovaries in seven patients with amenorrhea, obesity, and hirsutism; as a result, PCOS syndrome was first referred to as Stein–Leventhal syndrome. Prior to their research, which dates back to 1721, the larger-than-normal ovaries of young married women who were infertile and somewhat fat were detected, but this information was not known at the time. Chereau first reported the sclerocystic

alterations in ovaries in 1844, but it wasn't until Stein and Leventhal conducted thorough studies on the subject that it was acknowledged. Dams and colleagues conducted additional study in 1985 and discovered polycystic ovaries with an excessive number of follicles. They named this disorder multifollicularity. Per its description, polycystic ovaries are defined as having more than ten peripherally organized cysts, each ranging in size from 2 to 8 mm [6].

NEED OF STUDY:

Between the ages of 18 and 24, female fertility peaks. From that, it starts to diminish, and from the age of 35, it declines considerably more quickly.

Because PCOS is a poorly characterized illness that mostly depends on the use of diagnostic criteria, its precise prevalence is unknown. According to WHO estimates, as of 2010, 116 million women globally (or 3.4% of women) were affected. According to a community-based prevalence survey that used the Rotterdam criteria, roughly 18% of women had PCOS, and 70% of them had never received a diagnosis. Eight to twenty-five percent of normal women have polycystic ovaries on their ultrasonography. It was discovered that 14% of women using oral contraceptives had polycystic ovaries.

As stated by WHO

PCOS, or polycystic ovarian syndrome, is thought to impact 7-8% of women who are fertile. Worldwide, up to 70% of afflicted women go undetected. The most frequent cause of anovulation and a major contributor to infertility is PCOS. Numerous chronic health issues that impact both physical and mental well-being are linked to PCOS. Millions of women worldwide suffer from the complex endocrine condition known as polycystic ovarian syndrome, or PCOS. Hormonal imbalance is one of its distinguishing characteristics; this might show up as irregular menstrual periods, increased testosterone production, or ovarian cyst formation. Costs associated with medical consultations, diagnostic testing, and prescription drugs might be prohibitive. For a lot of women, having a job determines whether they can afford these basics. It gets harder to get specialist care for hormone imbalances when one does not have a reliable source of income, which exacerbates symptoms and lowers quality of life. Additionally, having a purpose and feeling fulfilled at work enhances one's general well-being, which includes mental health. In addition to its negative effects on physical health, PCOS can cause psychological anguish because of its symptoms and related consequences, which include weight gain and

infertility. In addition to being a diversion from PCOS's difficulties, fulfilling work increases a sense of accomplishment and strengthens one's resilience in the face of hardship. Moreover, job routines and structure have a good impact on lifestyle factors that are known to affect hormone balance. Developing healthy routines, such as consistent exercise and food preparation, can assist in controlling weight, insulin resistance, and other metabolic issues that are frequently linked to PCOS. Furthermore, upholding a work-life balance promotes appropriate relaxation and stress reduction, both of which are essential for hormone regulation and symptom management [7].

Effect Of Hormonal Imbalance:

1. Stress, and sleep:

Stress is characterized as any circumstance that throws off the balance that exists between a living being and its surroundings. There are many stressful situations in daily life, including pressure from work, exams, mental stress, and physical stress from injuries, surgeries, and various medical conditions.

2. Hormone disturbance, weight gain, and weight loss:

It is well known that thyroid hormones control the body's basal metabolic rate. Numerous physiological alterations may result from either a drop (hypothyroidism) or an increase (hyperthyroidism) in the secretion levels. Weight gain, depression, hair loss, low energy, dry skin, constipation, and intolerance to cold are all symptoms of hypothyroidism. Diarrhea, excessive energy, weight loss, and a perpetually warm body are all symptoms of hyperthyroidism. Insulin resistance (hyperinsulinemia) and hormone imbalance The pancreas secretes insulin, which controls the metabolism of fat, protein, and carbohydrates. Soon after a blood meal, it lowers blood glucose levels. The body's ability to produce and use enough insulin to maintain blood sugar at the ideal levels for efficient metabolism is



essential for good health. Any change in insulin levels can lead to a number of different illnesses. Insulin is not absorbed by cells when insulin signals are absent. We call this insulin resistance. Increased blood glucose levels and fat accumulation are the outcomes, which cause obesity and type II diabetes. The amount of androgens that can cause acne, infertility, facial hair development, hair loss on the head, dark spots on the neck, or skin tags increases when there is insulin resistance. Moreover, it triggers PCOS, or polycystic ovarian syndrome [8].

3. Hormonal Imbalance and Infertility

By generating gonadotrophin-releasing hormones, the hypothalamus regulates the pituitary gland, which in turn regulates most other hormone glands in the human body either directly or indirectly. Changes in the chemical signals originating from the brain can thereby impact the thyroid, pituitary, ovaries, and mammary glands, ultimately leading to changes in hormone levels. Hyperthyroidism, hypothyroidism, polycystic ovarian syndrome (sometimes called Stein-Leventhal syndrome),

and hyperprolactinemia are among the hormonal disorders that impact ovulation. One of the main causes of anovulation is hormonal imbalance. Hormone abnormalities prevent women from producing enough follicles to guarantee the development of an ovule. Stress may alter the hormonal balance of the hypothalamic-pituitary-adrenal axis (HPA-axis). [9]

4. Hormones Imbalance and Mood:

The main messengers that affect an individual's behavior are hormones, which integrate, regulate, and control physiological processes. A person's alterations in conduct are also regulated by sex hormones. Prolactin, cortisol, and endorphins also play an indirect role in humor regulation, while serotonin, dopamine, and oxytocin are the other main messengers. Prolactin: Another name for prolactin hormone is luteotropic hormone, or luteotropin. Prolactin secretion is the function of the pituitary gland. In the central nervous system, prolactin binds to the substantia nigra region, the choroid plexus, and the hypothalamus [10].

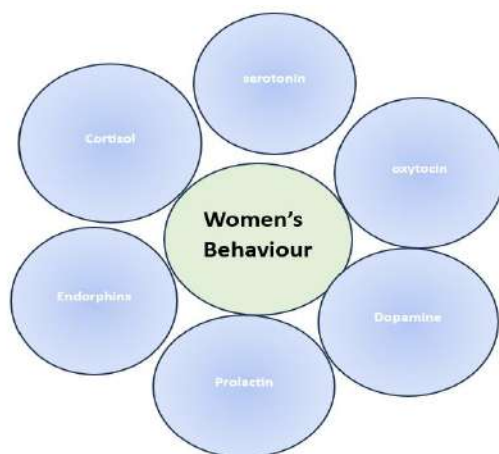


Figure No.2. Women's behaviour apart from sex hormones.

5. Hormone Imbalance And Polycystic Ovarian Syndrome (PCOS):

Menstrual abnormalities marked by hyperandrogenism, infertility, and recurrent anovulation are thought to be common causes of PCOS, an endocrine condition [11]. Of all women of reproductive age, between 10% and 13% are

reported to have had infertility or anovulation. Numerous metabolic conditions have also been linked to PCOS. While some women may only have one ovarian cyst, others may have polycystic ovaries. Insulin resistance is thought to be PCOS's primary cause. Insulin resistance reduces the body's capacity to metabolize and absorb glucose,

as previously mentioned. Because the ovaries are sensitive to insulin, they attempt to make up for imbalances in insulin concentration by creating more ovarian hormones, which can cause disruptions in the body's metabolic processes [12]. Acne, infertility, facial hair development, head hair loss, dark spots on the neck, and skin tags are some of the possible side effects. Increased testosterone levels and any mutation in the luteinizing hormone and/or its receptor have also been implicated as reasons [13].

SYMPTOMS:

Possible symptoms include:

- Heavy, long, intermittent, unpredictable or absent periods
- Infertility
- acne or oily skin
- excessive hair on the face or body
- male-pattern baldness or hair thinning
- weight gain, especially around the belly.
- weight gain
- The hump of fat between the shoulders
- unexplained and sometimes sudden weight loss
- fatigue
- muscle aches, tenderness, and stiffness
- pain, stiffness, or swelling in your joints
- increased or decreased heart rate
- sweating
- constipation or more frequent bowel movements
- frequent urination
- increased thirst
- increased hunger
- decreased sex drive
- depression
- nervousness, anxiety, or irritability
- infertility
- thinning hair or fine, brittle hair
- dry skin

The hormonal imbalance mostly occurs in teenagers. Teenagers love to eat junk food or street food with oil content as well as harmful ingredients that cause hormonal imbalance [14].

NOODLES

Noodles are among the most well-liked foods in many Asian nations. Noodles originated in China, but because to globalization, consumer acceptability, ease of use, and extended shelf life, they have gained popularity all over the world. With a yearly production of 101,420 million packs in 2012 and a consistent 3% annual growth since 2010, instant noodles have grown in importance as a food item worldwide (World Instant Noodle Association, 2013). Typically, the formulation consists of functional additives that affect the final product's properties along with wheat flour or flour derived from non-wheat grains. Noodles made from wheat primarily consist of flour, salt, and water. Because of varied production processes, noodles are available in a variety of forms and sizes [15]. The focus of many scientists' attention these days in India is on "Nutraceutical" products. These substitute goods blur the distinction between food and medicine. "Nutrition provides in the form of pharmaceuticals" is what it means. The population starts to focus more on nutrition as parents become more aware of the importance of a balanced diet as a result of children's obesity becoming a global problem as modern science uncovers its secrets. [16] One of the main foods eaten in many Asian nations is noodles. The use of instant noodles is growing globally as they have gained recognition as a cuisine. Instant noodles have gained popularity due to its taste, nutrition, ease of use, safety, extended shelf life, and affordable pricing. Color, flavor, texture, cooking quality, pace of rehydration during the latter stage of preparation, and the presence or absence of rancid taste after extended storage.

HISTORY



Asian noodles first appeared in China around 5000 BC. Momofuku Ando created the "Chicken Ramen TM" formula. Japan's Nissin Foods produced the first instant noodle product on a large basis in 1958. His achievements are used to deliver a revolution in culinary culture. He invented the "instant" noodle by mounting the manufacturing process of flash-frying noodles after they were prepared. In this way, the noodles were dried and given an extended shelf life—even longer than that of frozen noodles. After being pre-flavored, each noodle block is marketed for 35 years. Since fresh noodles were normally sold in eastern grocery stores for one-sixth of the price, "Chicken Ramen" was initially perceived as a luxury item due to its novelty and high cost. Despite this, instant noodles gained a great deal of popularity, particularly after Mitsubishi Enterprise began to support them. In 1971, Nissin introduced Nissin Cup noodles. These are instant noodles in a polystyrene cup that are cooked by adding boiling water to provide a complete instant soup dish. In an innovative move, dry veggies are also added to the cup [17].

Market Earns By Noodles:

- In India, Sunfeast Yippee is the second most popular brand in the noodle market. Sunfeast has a lot of room to grow in terms of marketing in order to reach more specific people.
- Knorr soupy noodles are the only kind of noodles accessible in the market, and the company employs marketing techniques quite well. They conduct a very eye-catching ad called "Kha Ke Pio, Ya Pi Ke Khao." Knorr can increase market share by enhancing its marketing.
- Top Ramen introduced its noodles to the market under the distinctive term "smoodle," which translates to "smooth noodles." In their marketing effort, they utilize the phrase "it's not noodle, it's smoodle" to draw in viewers

and encourage them to try and enjoy their noodles [18].

Classification Of Noodles:

A. Based On Raw Materials

You can make noodles with just wheat flour or with a combination of buckwheat flour and hard wheat flour. Soba, or buckwheat noodles, are wheat flour noodles that have a specific amount of buckwheat flour (often less than 40%). Korea and Japan both consume a lot of soba. Usually light brown or gray in color, the noodles have a distinct flavor. There are two main varieties of noodles available, the Chinese and the Japanese, depending on the sort of wheat utilized. Japanese and Chinese types, respectively. Hard wheat flour, which has a firm texture and a bright creamy white or bright yellow color, is typically used to make Chinese-style noodles. Japanese noodles have a creamy white hue, a soft and elastic feel, and are usually produced from medium-protein soft wheat flour. You can fit other noodles into either category.

B. Based On Salt Used

Noodles can be categorized as either yellow alkaline (containing alkaline salt) or white salted (containing common salt) depending on whether alkaline salt is present in the recipe or not. The yellow hue of noodles is attributed to alkali. Japanese noodles, Korean white salted noodles, and Chinese raw or dry noodles are all types of white salted noodles. The category of yellow alkaline noodles includes Hokkien noodles from China, noodles from Cantonese cuisine (either with or without eggs), Chuka-men, quick noodles, and noodles from Thailand.

C. Based On Size

Japanese noodles are divided into four categories based on the breadth of the noodle strands (Table II). So-men and hiya-mugi are typically served chilled in the summer, whereas hira-men are frequently eaten hot in the cool seasons because smaller noodles typically soften faster in hot water

than larger noodles. Every type of noodle has a standard size.

Table no: 1 Table No.1 Oriental Noodle Classification Based On Processing

Sr . No.	Noodles Type	Processing
1	Fresh	After being split into rolls, the noodles are chopped into predetermined lengths for packaging. Cantonese noodles, udon noodles, Thai bamee, chuka-men, Chinese raw noodles, and soba noodles are typical examples. Because these noodles discolor quickly, they are frequently eaten within 24 hours of being made. If kept refrigerated, their shelf life can be increased to three to five days.
2	Dried	Strands of fresh noodles are dried in a controlled environment or in the sun. You can find dried versions of Chinese raw noodles, Cantonese noodles, Japanese noodles, chuka-men, and soba noodles. The shelf life of noodles is significantly increased, but handling issues may arise with delicate noodles.
3	Boiled	Either fully cooked or parboiled are the two types of fresh noodle strands. Soba noodles, udon noodles, chuka-men, and Chinese wet noodles are examples of this type. Chinese wet noodles are parboiled, then washed in cold water, drained, and sprayed with 1-2 percent vegetable oil to keep them from sticking.
4	Steamed	Steamed fresh alkaline noodle strands are steeped or rinsed with water to soften them. This kind goes by the name "Yakisoba" as well, and it's typically stir-fried before eating.
5	Instant	For two to three minutes, fresh noodle strands are steam-warmed. Noodles are sliced into blocks and then dried by either hot blast air (70–80°C) for 35 - 45 minutes or deep frying in hot oil (135–150°C) for 1 or 26 minutes.

Ingredient Use In The Formulation Of Noodles:



Fig No. 3. Fermented Wheat Porridge

1. Fermented Wheat Porridge:

Fermented wheat porridge is a traditional dish found in various cultures around the world. It is made by fermenting wheat grains, which enhances their nutritional profile, flavor, and digestibility.

Fermented wheat porridge offers several health benefits due to the fermentation process and the nutritional properties of wheat. Here is a detailed overview of the health benefits associated with fermented wheat porridge.

Fermentation Process

1. Soaking:

Wheat grains are soaked in water for 4 Days. Every morning the soaking water is replaced with fresh water. This initiates the softening and partial germination of the grains.

2. Fermentation:

The soaked grains are left at room temperature to ferment. This can take anywhere from 24 hours to several days, depending on the desired flavor and sourness. The natural lactic acid bacteria present on the grains or from a starter culture facilitate the fermentation process.

3. Cooking:

After fermentation, the grains are cooked with additional water until they reach a porridge-like consistency

Health Benefits of Fermented Wheat Porridge

1. Improved Digestibility : Fermentation breaks down complex carbohydrates, proteins, and fibers in wheat, making the nutrients easier for the body to digest and absorb. This is particularly beneficial for individuals with digestive issues or sensitivities to grains.

2. Enhanced Nutrient Bioavailability

Fermentation reduces the levels of antinutrients like phytic acid in wheat. Phytic acid can bind to minerals such as iron, zinc, and calcium, reducing their absorption. By breaking down phytic acid, fermentation increases the bioavailability of these essential minerals.

3. Probiotic Content :

Fermented wheat porridge contains beneficial lactic acid bacteria, which can help balance the gut microbiota. Probiotics support gut health by enhancing the growth of beneficial bacteria, aiding in digestion, and boosting the immune system.

4. Increased Vitamin Content :

The fermentation process can increase the levels of certain vitamins, especially B vitamins such as B1 (thiamine), B2 (riboflavin), and B3 (niacin). These

vitamins are crucial for energy metabolism, brain function, and maintaining healthy skin [19].

2. Black Kidney Beans:



Fig No: 4 Black kidney beans

- Scientific Name: Phaseolus vulgaris
- Family: Fabaceae
- Morphology: Small, shiny, and black with a kidney-shaped structure.

Black kidney beans, also known as black beans, are a nutrient-dense legume that can offer various health benefits, particularly about hormonal balance.

Health Benefits

1. Rich in Phytoestrogens :

Black beans contain phytoestrogens, which are plant-based compounds that mimic estrogen in the body. These can help in balancing hormones, especially in women experiencing menopause or hormonal fluctuations.

2. High in Fiber :

The high fiber content in black beans aids in the regulation of blood sugar levels. Stable blood sugar is crucial for maintaining hormonal balance, as fluctuations can lead to imbalances in insulin and other hormones.

3. Antioxidants :

Black beans are high in antioxidants, such as flavonoids and polyphenols. These antioxidants help reduce oxidative stress, which can negatively impact hormonal health.

4. Support for Gut Health :

A healthy gut microbiome is essential for hormonal balance. The fiber in black beans

promotes gut health by acting as a prebiotic, feeding beneficial gut bacteria.

3. Ash Guard:



Fig No: 5. Ash Guard

Botanical Characteristics

- **Scientific Name:** Benincasa hispida
- **Family:** Cucurbitaceae

Morphology:

- **Fruit:**

Large, oblong, or cylindrical, with a waxy coating that helps in storage.

- **Leaves:**

Broad, heart-shaped with serrated edges, covered in fine hairs.

- **Flowers:**

Yellow, large, solitary, and unisexual.

- **Seeds:**

Small, flat, and white [20].

Health Benefits

1. Digestive Health

- **Laxative Effect:**

The high water and fiber content aid in preventing constipation and promoting regular bowel movements.

- **Gastroprotective:**

Used traditionally to treat digestive disorders such as peptic ulcers and gastritis.

2. Hydration and Cooling Effect

- **Hydration:**

High water content helps maintain hydration and electrolyte balance.

- **Cooling Properties:**

Used in traditional medicine to cool the body, especially in hot climates [21].

3. Weight Management

Low Caloric Density: Being low in calories and high in water makes it an excellent food for weight management.

4. Antioxidant and Anti-inflammatory Effects

- **Antioxidant Activity:**

Rich in flavonoids and vitamin C, which help neutralize free radicals and reduce oxidative stress.

- **Anti-inflammatory Properties:**

Beneficial in reducing inflammation and associated conditions.

5. Metabolic Health

- **Blood Sugar Regulation:**

Polysaccharides and dietary fiber help regulate blood sugar levels, making it beneficial for diabetic patients.

- **Cholesterol Management:**

Phytosterols and fiber help lower cholesterol levels.

6. Immune Support

Immune Modulation:

Polysaccharides and other bioactive compounds enhance immune response.

7. Detoxification

Diuretic Effect:

Promotes diuresis, helping detoxify the body and reduce edema.

8. Mental Health

Anxiolytic Properties:

Traditionally used to alleviate anxiety and promote mental relaxation [22]

4. Lentil Grain:



Fig No:6 lentil flour

Botanical Description

Family:

Fabaceae

Common Name:

Lentil

Scientific Name:

Lens culinaris

Morphology:

Lentil is an annual legume with slender, semi-erect stems, compound leaves with multiple leaflets, and small, white to pale blue flowers. The seeds are lens-shaped, which is the origin of their name[23].

Benefits of Lentils

1. Nutritional Benefits

- **High Protein Content:**

Provides essential amino acids, making them a valuable protein source for vegetarians and vegans.

- **Rich in Fiber:**

Aids in digestion, helps regulate blood sugar levels, and promotes a feeling of fullness.

- **Low Glycemic Index:**

Beneficial for blood sugar management, especially for individuals with diabetes.

2. Health Benefits

Cardiovascular Health:

Rich in dietary fiber, folate, and magnesium, which support heart health by reducing cholesterol levels and improving heart function.

Antioxidant Properties:

Phenolic compounds and vitamins such as vitamin C and E help in combating oxidative stress, thereby reducing the risk of chronic diseases like cancer.

Digestive Health:

High fiber content promotes regular bowel movements and prevents constipation.

Weight Management:

Low in calories but high in protein and fiber, lentils help in maintaining a healthy weight by promoting satiety [24].

3. Medicinal Uses

Anti-inflammatory:

Bioactive compounds in lentils have shown anti-inflammatory properties, which can help in reducing the risk of inflammatory diseases.

Antidiabetic Effects:

Lentils help in maintaining blood glucose levels due to their low glycemic index and high fiber content.

Anticancer Potential:

Phenolic compounds in lentils exhibit antiproliferative activities against various cancer cell lines [25].

5. Amarnath (*Amaranthus* spp) :

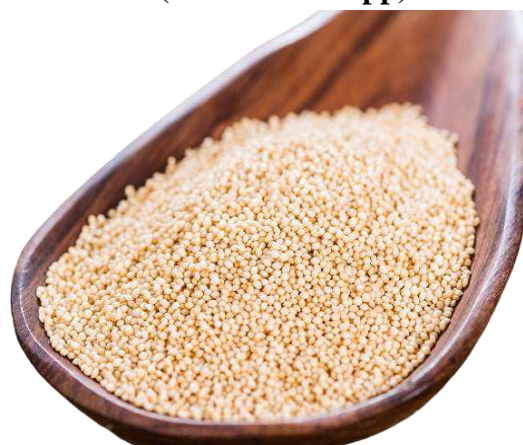


Fig No.7: Amarnath (Rajgira)

Morphological Characters

Leaves:

Simple, alternate, ovate to lanceolate, with a glossy green appearance.

Stems:

Erect, often reddish or green, with longitudinal striations.

Flowers:

Small, densely clustered in terminal or axillary spikes, can be green, red, or purple.

Seeds:

Small, shiny, and lenticular, typically black, white, or brown [26]

Pharmacological Activities

Antioxidant:

Due to high phenolic and flavonoid content.

Anti-inflammatory:

Inhibits pro-inflammatory cytokines.

Antidiabetic:

Regulates blood sugar levels.

Antihyperlipidemic:

Reduces cholesterol levels.

Anticancer:

Exhibits cytotoxic activity against certain cancer cell lines.

Antimicrobial:



Effective against a range of bacterial and fungal pathogens.

Gastroprotective:

Prevents gastric ulcers and enhances digestive health [27] [28].

METHODS AND FAILURES

Table No: 2 : Methods and failures

Sr. No.	Ingredient	Failures	Picture
Trial 1	Little millet, foxtail millets, finger millet (<i>Eleusine Coracana</i>), Moringa leaves powder, fresh ash guard juice	Trail 1 in that we observed the failures is noodles are break not in the round shape and after adding in the water noodles are dissolved	
Trial 2	little millets, finger millet, wheat flour 10gm, and foxtail millets and mixed with ash guard juice.	Faults in installing species in the middle of noodles and lumps formation	

FORMULATION TABLE:

Table No: 3: formulation table

Sr. No.	Ingredient	Quantity
1	Fermented wheat porridge	50gm
2	Black kidney beans flour	15gm
3	Lentil flour	15gm
4	Water	60ml
5	Ash guard juice	20ml
6	Amarnath Flour	15ml
7	Salt	0.5 gm
8	coriander powder	0.5 gm
9	Sunflower seed powder	0.5 gm
10	Flaxseed powder	0.5 gm
11	Nigella sativa powder	0.5 gm
12	Spinach powder	0.5 gm
13	Chia seed powder	0.5 gm

METHODS AND PREPARATION:

250 gm of wheat sowing 1 lit of water for 4 days. 50g of fermented wheat porridge, salt, and water were used to make the noodles. In order to create a smooth dough for sheeting, the salt was first

dissolved in the water. Next, the 15 grams of lentil flour, 15 grams of black kidney bean flour, 60 ml of water, and 15 grams of royal grain flour were combined, along with 20 ml of ash guard juice. This process took about 15 minutes. Before being



cut into 4 mm-thick strands, the thickness of the sheet was gradually decreased by reducing the roller spacing. The dough was put in a noodle-making machine and formed into round noodles. When using newly made noodles, steam them for ten to fifteen minutes, or until they are halfway done. The steam-cooked noodles were placed on trays and allowed to dry in the sun for around 6 to 8 hours. To ensure permanent drying, they were

then placed in a hot air oven set at 60 degrees Celsius for an additional 6 to 8 hours, or until the product's moisture content had reached roughly 12%. The trays were then left to cool for thirty minutes at room temperature in the surrounding air. After that, it is loosely packed, carefully sealed, and kept at room temperature. Next, incorporate the noodles. Then add noodles in it boil for 5 min and add all species after boiling[29].



Fig No: 8 : weighing of Ingredient



Fig No: 9: weighing of fermented wheat



Fig no 10: mixing of ingredients



Fig No: 11 rounds shaped of noodles

EVALUATION TEST

1. Color:

This is one of the most crucial elements since it is the first thing a customer sees and is used to determine the perceived characteristics of the noodles. There are no coloring additives applied to the brownish-colored noodles; this color is their natural color [30].

2. Texture:

Texture is a regional variations in wheat quality, salt selection and amount, alkaline mixes, and processing variables including steaming, sheeting, and dehydration methods, texture is a factor that varies widely. Noodles with acceptable textural qualities were made from flour with a low maltose concentration, a high protein content, and dough resistance [31].

3. Flavor:



It is impossible to overstate the significance of flavor in noodles. At the same time that it can satisfy the palate when cooking, the product's rejection may also result from the taste going rancid after a long period of storage. It is flavored with species such as cinnamon and ginger powder.

4. Cooked weight (g):

This measurement, which represents the weight increase of the noodles while cooking, reveals how much water was absorbed and, as a result, serves as a gauge for the noodles' capacity to swell. The 10g instant noodles were cooked in 300ml of distilled water in a beaker until they were cooked to perfection, then they were drained, rinsed with distilled water, and allowed to cool at room temperature for five minutes. After cooling, the cooked noodles were weighed again. The weight that was cooked was stated in grams.

5. Cooking time:

By squeezing the noodles between two transparent glass slides and timing the disappearance of the noodle strand core every 20 seconds, the ideal cooking time was determined.

6. Cooking loss:

The amount of solid material lost to cooking water was measured in order to calculate the cooking loss. In a 500 ml beaker, 100 ml of boiling water was added to a 10-g sample of noodles. A pre-weighed glass dish with the cooking water was placed in a hot air oven set at 105°C until the water

evaporated completely. A percentage was reported based on the weight of the dry residue [32].

7. Water uptake:

The water uptake was determined by dividing the weight of dried noodles by the weight of cooked noodles. Prior to weighing, the cooked noodles were blotted of any excess adherent water by placing them on filter paper for five minutes [33].

8. Moisture Content Determination:

- Weigh an empty, dry container (A) and record its weight.
- Weigh a sample of noodles (B) and record its weight.
- Place the noodles in an oven set at a specific temperature (typically around 105°C) for a specified period (usually 2-4 hours).
- After drying, remove the container and noodles from the oven. Allow it to cool in a desiccator.
- Weigh the container with the dried noodles (C) and record its weight.
- Calculate the moisture content using the formula: $\text{Moisture Content (\%)} = [(B - C) / B] * 100$.

RESULT AND DISCUSSION:

Proximate analysis and cooking quality of incorporated noodles has been studied and presented in below Table 4. In cooking quality evaluation cooking time, cooking loss and water uptake was studied .

Table No: 4: Evaluation test table

Sr. No.	Parameter	value
1	Cooking time (9min)	10.5 min
2	Cooking loss (g)	1.19
3	Water uptake (g)	11.3
4	Moisture content	10.5%
5	Ash value	1.5%

CONCLUSION:

The study explores the development and evaluation of nutrient-rich noodles designed to address hormonal imbalances in teenage girls,

focusing on conditions like polycystic ovarian syndrome (PCOS). Recognizing the significant role of hormones in regulating physiological

processes and the high prevalence of hormonal disorders among young women, this research

In conclusion, the specially formulated nutrient-rich noodles show promise as a dietary intervention for hormonal imbalance, offering a practical, nutritious, and convenient food option for teenage girls. This research underscores the importance of developing functional foods that not only meet dietary needs but also address specific health concerns prevalent in today's society.

FUTURE SCOPE:

The study highlights the potential of functional foods like nutrient-rich noodles in managing hormonal imbalances among teenage girls. Future research should focus on:

- **Clinical Trials:**

Conducting clinical trials to assess the long-term efficacy and safety of these noodles in a larger population of teenage girls with hormonal disorders.

- **Nutrient Optimization:**

Further optimizing the nutrient composition to enhance the hormonal balancing properties while maintaining sensory appeal.

- **Market Viability:**

Evaluating the market acceptance and commercial viability of these noodles, considering consumer preferences and potential barriers to adoption.

CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

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