

TRADITIONAL CEREAL-BASED DISHES OF THE NEWARI COMMUNITY OF NEPAL AND THEIR PREPARATION PROCESS

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Summary

Around the world, cereal grains provide a significant source of dietary nutrients. Since prehistoric times, cereal-based food products have formed the foundation of the human diet. Fermented foods made from cereals account for a significant portion of the calorie intake in developing nations. Worldwide dietary recommendations are urging the consumption of whole grains due to mounting evidence that these grains and food products made from them can improve health in ways other than just giving energy and minerals. The creation of novel food items with qualities that improve health will be aided by the understanding gained from the functional qualities of the many chemical components found in whole grains.

Therefore, the main aim of this study is to illuminate the varied application of cereals like rice, maize, wheat, and barley in preparing a wide range of delightful dishes like (Aila, Dhindo, Yomari, Selroti, Chatamari, Khurma, Chiura, and Lakhamari) which holds immense significance in shaping the cultural identity of the Newari community. In this study, the nutritional advantages of cereals highlight their crucial role in maintaining the health and well-being of the Newar community. Cereals are abundant in essential vitamins, fibers, minerals, and carbohydrates as a fundamental component of a well-balanced diet that promotes overall well-being.

Keywords: traditional dish, Nepal, Newari culture, Aila, Dhindo, Chatamari, Lakhamari.

DOI: 10.21303/2504-5695.2023.003192

1. Introduction

Nepal is a Himalayan country that has a 147,181 sq. km total area and is situated between latitudes 26220 and 30270 north and east 8040 and 88120 east. It is part into three regions: the mountain range(north), the mid-hills, and the terai (south) [1]. According to [2], Nepal is a multilingual,

multicultural, and multi-religious country that has mostly agricultural bases where local consumption of native and cultural traditional food varieties continues. It is also a multi-ethnic community country that has its unique traditions, languages, cultures, and cuisines [3]. According to [4], there are numerous castes, including Brahmin, Chhetri, Newar, Magar, Limbu, Sherpa, Gurung, Damai, Rai, Kami, and Sharki, who live in mountainous and hilly regions. The several Adhibasi (Tribes) of Terai include the Dhimal, Tharu, Satar, Rajbansi, and other ethnic groupings, different castes have their kind of traditional foods passed from their ancestors.

Traditional food is both fermented and non-fermented food which is important for food preservation, culture, and ethical practices. Simply traditional meals are said to be those that are eaten in the same manner that our forefathers did. Traditional cuisines are selected as the simple food alternatives that fit within the financial and geographic constraints. A given group's norms and beliefs are closely related to its traditional cuisine [2]. There are numerous types of traditional meals accessible in Nepal [5]. According to [2], some of the non-fermented dishes are Puwa, Chaku, Kasar, Chiura, Khir, Dalmodh, Dhakane, Jimbo, Chuyri-Ghiu, Chook-amilo, Makai-Bhatamas whereas some of the fermented beverages and foods of Nepal are Selroti, Sinki, Masyaura, Kinema, Jilebi, Gundruk, Mesu, Dahi, Fulaura, Chhurpi, Jand, Ghiu, and Rakshi. Traditional foods can help supplement the lack of seasonal food and nutrients and improve quality of life. In times of seasonal deficiency, traditional foods may significantly augment the population's nutritional needs or serve as a source of essential nutrients, which can also boost variety [1]. From [6], In the nation's various regions, there are numerous traditional cuisine products to be found. Some of them are healthy, some are appetizers, some have therapeutic (medicinal) properties, and some are snacks.

2. Materials and methods

A survey was conducted in a local area in Western people of Nepal in the Newari community. All information was obtained directly from the local members of the Newar community about the different types of traditional cereal-based products, the traditional preparation process and way of serving.

3. Result and Discussion

The Newar community in the western region of Nepal prepares and eats various types of traditional dishes using traditional processing methods such as cooking, steaming, and sun-drying for a long decade. The survey revealed that they use different types of cereal-based traditional cuisines with their preparation techniques. Ten types of traditional cereal-based products have been listed below.

3. 1. Production of cereals in Nepal

Nepal is an agricultural country. More than 60 % of Nepalese live from agricultural products Growing employment can also contribute to the national economy in GDP (Gross Domestic Production), contributing by 33 % [7]. As per the study by [8], Agriculture is an important part of any nation's economy. Due to increasing poverty, trade diversion, and inflation rate, the share of agriculture in Nepal's GDP has decreased from last fiscal year to this year (from 27.59 % to 26.98 %) respectively. Cereals (rice, wheat, and corn) are the most important and widely grown crops and are consumed worldwide [9]. As Nepal is an agricultural country but it is also dominated by major three crops, (rice, wheat, and corn) [2]. The production of cereals is presented in **Fig. 1**.

Nepal ranks 72nd on the world hunger index of 22.0 compared to other countries, and grain production in Nepal still does not meet the current food demands of Nepalese people [2]. In the past, several studies have been conducted on the situation of agriculture in Nepal, but there has not been sufficient literature to meet the growing food demand or supply [12]. **Table 1** describes the different types of cereal-based traditional dishes of Newari cultures and their uses.

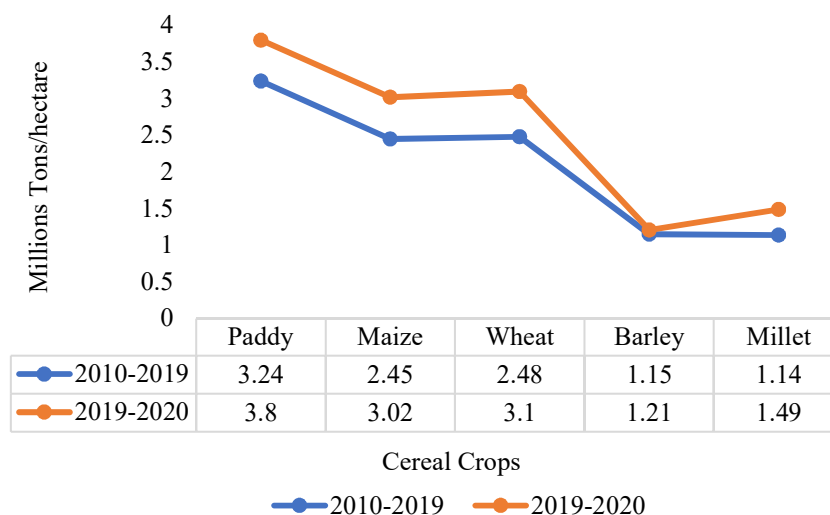


Fig. 1. Changes in the production of cereal crops in Nepal
Source: [10, 11]

Table 1

Cereal-based product of Newari culture and their uses

Product	Cereal used	Nature and use
Raksi (Aila)	Finger millet	Liquid with alcohol % up to 20
Dhindo	Finger millet, maize etc.	Soft, served hot with ghee
Yomari	Rice flour	Soft, nutrient-dense filled with spices and sweetness
Selroti	Rice flour	Fried, soft when served hot and hard after cool
Chatamari	Rice flour	Shape like pizza or pancake
Khurma	Rice and wheat flour	Fried product with combination of spices, ghee etc.
Chuiru (Baji)	Beaten rice flakes	Pre-cooked prepared from beaten rice flakes, served at morning breakfast or Newari dishes
Lakhamari	Wheat flour	Sweet bread type and fried

3. 2. Newari Raksi (Aila)

The Newar ethnic community mainly prepares two different types of alcoholic beverages commonly known as Jand, also known as local beer, which has a lower concentration of alcohol, as well as another liquor called Raksi, which has a high concentration of alcohol. Prepared Raksi is mainly consumed during social events, festivals, or other ceremonial activities [13]. Aila is similar to Raksi, which is mainly prepared by the Newar community and served during the festival along with Newari cuisine [14, 15]. Jand contains suspended solids and yeast and is mainly categorized as Grian beer. During distillation, Jand is transformed into Raksi, a traditional spirit with an alcohol content between 15 and 50 % [1]. Aila or Raksi is unaged liquor produced from various ingredients such as fermented millet, wheat, rice, or a combination of grains[3]. According to [16], the Raksi, or the Aiyla, is a powerful “snups” prepared from local and different cereals grains such as rice, millet, rye, wheat, barley, corn, or fruits. The production method of Jand is given in **Fig. 2**.

After the production of Jand, it is then distilled with a distillation vessel by a traditional method shown in **Fig. 3**.

The prepared Raksi or Aiyla or Aila is served in a small bowl of clay, which comes from the grandmother. It is believed that pouring an Aiyla is a pride for women and is poured into the mud bowl from a height of about one meter without a single drop falling out of the

mud bowl [16]. Due to the presence of alcohol content cereal-based alcoholic products such as Jand and Raksi have a calorific of about (405 kcal) in Bhatee Jand, and similar (394 kcal) in Koddoko Jand [1].

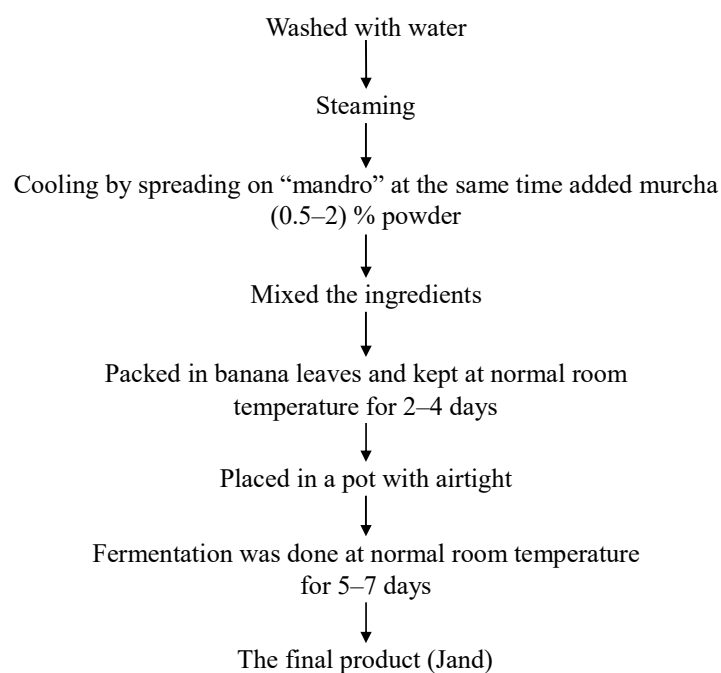


Fig. 2. Traditional method of Jand process



Fig. 3. Traditional method of Raksi production

The chemical composition of prepared kodo-based alcohol is listed in **Table 2**.

Table 2

Chemical composition of Kodo-based alcohol [1, 17, 18]

Alcoholic liquor	Moisture	Protein	Fat	CHO	Crude fiber	Ash
Bhatee Jand %	83.4	9.5	2.0	86.9	1.5	1.7
Koddoko Jand %	69.7	9.3	–	83.7	4.7	5.1

Compared to Chyang, Koddoko Jand contains a high amount of essential amino acids including (threonine, valine, leucine, and isoleucine). Most pregnant women prefer this type of drink due to the presence of calorific value and also for regaining strength [1].

3. 2. Dhindo

Dhindo is a local national dish prepared from different types of grain flour such as millet, corn, and wheat [19]. Mountain people and other religions like Newar, Tamang, Chettri, Bahun, and almost all other cultures prefer Dhindo because of its special nature [20]. Dhindo is usually made by continuously adding cereal flour to hot or boiling water while stirring. Due to its soft and flabby texture, it can be consumed by people of all ages, especially effective for the old age group [19]. According to [21], dhindo is prepared from millet in Nepal because of its unique nutrient composition, easy availability, and ability to protect against biotic and abiotic stresses [21]. [22], a study found that students of village areas of Nepal mainly eat dhindo (a thick porridge made of millet or maize), which is consumed during the lunch break. The general making process of Dhindo is shown in Fig. 4 [2].

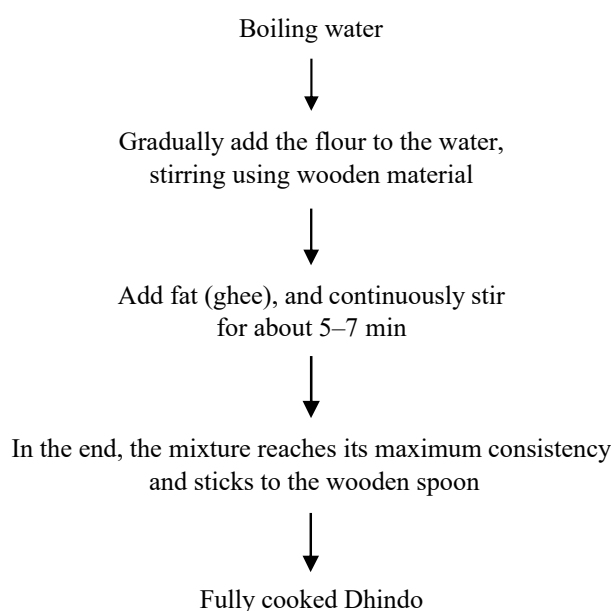


Fig. 4. Preparation method of cereal-based Dhindo

3. 3. Yomari

Yomari is a traditional Nepali delicacy that is prepared and consumed during the festival of Yomari Punhi, especially in the Newari community. The word “Yomari” is derived from two Newari words: “yo”, which means “to like”, and “Mari”, which refers to “roti”. It is a unique and delicious dish made with a combination of rice flour, molasses (known as Chakku), and lightly roasted sesame seeds [23]. Since it is made of rice, sesame seeds, and jaggery, adding minerals and vitamins will help it become more nutrient-dense and could lessen Nepal’s protein energy malnutrition (PEM) problem. However, the product’s low calorific value was discovered [2].

Method of preparation.

During the preparation of Yomari, rice is ground to create rice flour, which is then thoroughly kneaded with warm water at a temperature (50–55 °C). The resulting dough is allowed to rest for 3–4 hours. A small portion of the dough is shaped into a cup-like form. Sesame seeds are roasted and slightly crushed. Jaggery is prepared by heating it with a small amount of water and then filtrating it. The mixture of sesame seed and jaggery is gently cooked by adding

a small amount of water and flour. Once the blend of sesame seeds and jaggery is prepared, it is filled into a hollow cup-like structure. The filled dough is carefully sealed to achieve the desired shape. The dough is then steamed at a temperature of 90 to 98 °C for a minimum of 15 to 20 minutes until it reaches a soft texture. In this way, Yomari is prepared by the traditional method [2]. The preparation of Yomari is shown in **Fig. 5**.



Fig. 5. Dough for Yomari, Filling of Chakku, Steaming Yomari, Cooked Yomari

Nutrition value of prepared Yomari.

In a study conducted by [24], the moisture content of Yomari including jaggery and sesame seeds was determined to be 45.5 %. Yomari's composition revealed a crude protein content of 6.49 % and a crude fat content of 1.6 %. The ash content was also determined to be 0.83, and the crude fiber content was measured at 0.75. the carbohydrate content of Yomari was recorded as 44.81 %. furthermore, the calcium content of Yomari was analyzed to be 274.3 mg/100 g. The chemical composition of raw materials (wheat flour, selroti batter, and rice flour) is shown in **Table 3**.

Table 3

The chemical composition of wheat flour, selroti batter and rice [3]

Parameter	Wheat flour	Selroti batter	Rice
Acidity %	0.1	0.08	0.09
Moisture %	18.4	42.5	16.3
Total Sugar %	58.4	69.2	63.8
Ash (% DM)	0.5	0.8	0.7
Fat (% DM)	0.9	2.7	1.0
Protein (% DM)	11.0	5.7	8.3
Carbohydrate (% DM)	87.6	91.3	90.0
Calcium (mg/100 g)	20.8	23.8	9.4
Energy value (Kcal/100 g DM)	402.5	410.3	402.2

Selroti is a traditional and one of the famous food products in Nepal, particularly enjoyed during religious festivals and ritual processes by Newar, Magar, Chhetri, Tharu, etc. [2]. Selroti is a product with a ring-like shape made from rice flour and prepared by making a batter with the right consistency and frying it at a high temperature in oil or ghee. Selroti is also a favorite food across almost all of the nation's tribes, communities, and geographical regions [23]. Selroti is a well-known fermented cereal dish (mainly rice) that is deep-fried

and shaped like a ring. It is popular in Nepal, India's Darjeeling-Sikkim city, and Bhutan. It is made for special occasions and festivals. The Nepali word for ring-shaped bread made of rice is Selroti [25, 26]. According to [4], Selroti is a favorite food across practically all of the nation's tribes, villages, and geographical locations. It is a common and necessary ingredient in numerous celebrations, such as Maghe Sankranti, Tihar (Dipawali), and religious activities, such as Pooja (worship of the god Satyanarayan) and others.

Ingredients: Ghee, refined oil, rice flour, and sugar are the primary things used to make Selrotis. The manufacturing procedure and the substances utilized vary from one location and household to another depending on the availability of raw resources. Ripe bananas, dahi, and cream are also used as enhancers in some places [4].

Preparation.

According to [27], Selroti is traditionally prepared as per the following flow chart [25] which is shown below in **Fig. 6**.

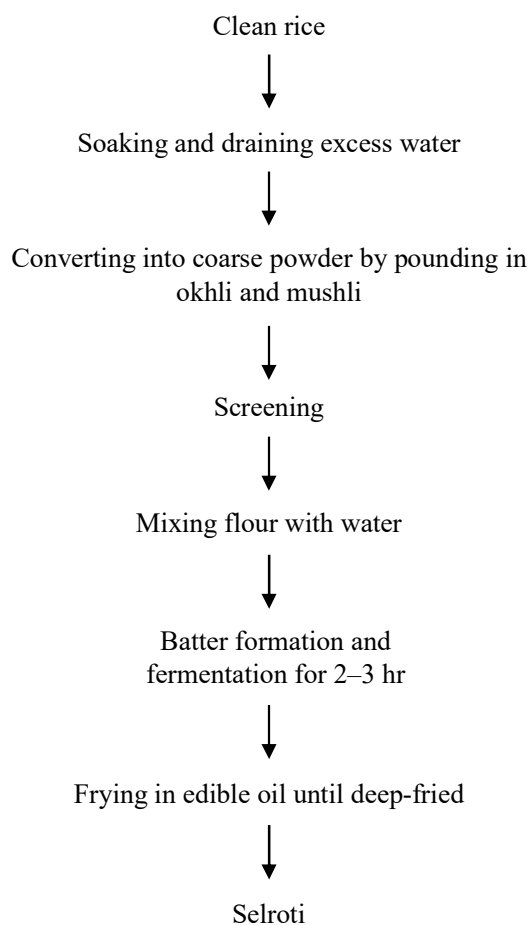


Fig. 6. The preparation process of Selroti

According to [2], Selroti is prepared by soaking the rice overnight for about 12 hours, and after soaking water is drained and grinds in Dhiki or Okhli into flour. After that flour made up of rice is mixed with ghee, fenugreek, sugar, etc. After mixing, kneading is done to make the proper texture. After that batter was formed by adding the proper amount of water and leaving it for some time for fermentation which helps in good swelling to Selroti. Then, the frying process was done by pouring the batter into hot oil in a ring shape and frying it on both sides until it turned yellowish brown taken out and removed excess oil, and Selroti was prepared. The Selroti preparation is shown in **Fig. 7, a, b**.

*a**b*

Fig. 7. The experimental samples of Selroti prepared by traditional method:
a – frying of Selroti; *b* – fried Selroti

3. 5. Chatamari

Chatamari is the rice-based Newari cuisine commonly referred to as Nepali pizza which also resembles a pancake. On celebratory occasions like Dewali or Degudeopuja, which happen in April or May, Chatamari is a must food for Newar [27]. From [23] Chatamari is a ritual delicacy served during digu puja and Guthi meetings, Chatamari is comparable to a pancake. A kind of pancake made with wheat flour called Chatamari [23]. According to [27], Chatamari can be consumed simply or with the addition of eggs, meat, or vegetables to improve the flavor. Below **Fig. 8** shows the prepared Chatamari with a topping of Newar culture.

Ingredients used to make Chatamari is three cups of rice flour, one cup of water (depending on viscosity), one cup of ghee or butter, and salt to taste. Chicken, or any other meat, should be minced or diced for toppings. 3 tablespoons of frying oil or butter, half a cup of diced tomatoes, 1 teaspoon of chopped ginger, 1 teaspoon of freshly crushed black pepper, and salt as per the taste [27]. Below **Fig. 9** shows the traditional preparation method of Chatamari.

Onion, garlic, and ginger were chopped into fine particles and the meat was minced. The pan was heated and oil was added to the pan. After the oil was heated the chopped garlic, onion, and ginger were fried until they changed color to a golden brown. After minced meat was added with pepper and salt and cooked until the meat was ready some chopped tomatoes were added and mixed well and the topping for Chatamari was ready to eat.



Fig. 8. Chatamari with toppings

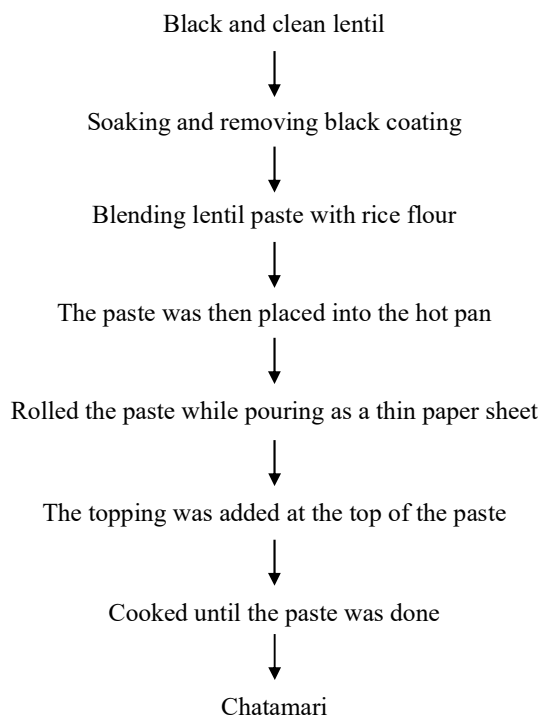


Fig. 9. Preparation flowchart of traditional Chatamari [3]

3. 6. Khurma

Khurma is the native meal of Nepal's hilly areas, made up of grain which is popular mostly among ethnic communities like Newar, Brahmin, and Chhetri. Khurma is a fried delicacy made of ingredients using flour and spices that are made by combining ghee, water, rice flour, wheat flour, sugar, semolina, and spices mixture. It has a closed palm or fist-like form and has a reddish-brown tint [5]. The nutritional value of optimized Khurma had the following nutritional value shown in **Table 4**.

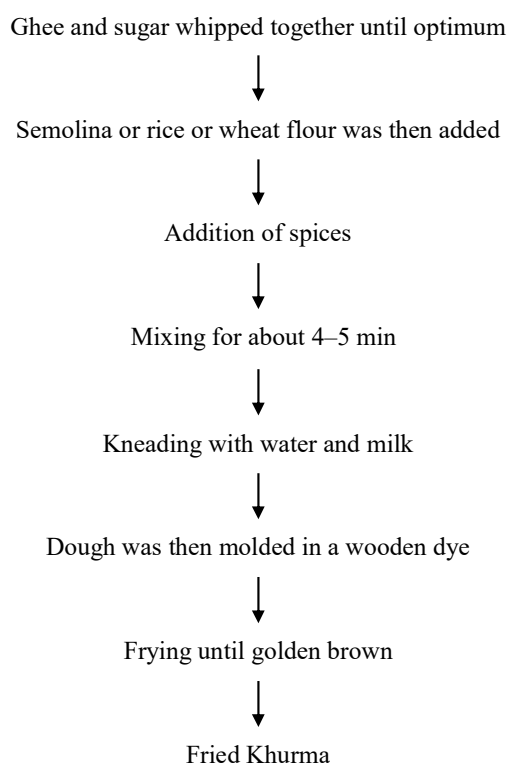
Ingredients such as wheat flour, ghee, rice flour, semolina, milk, water, and spices were used for the preparation of Khurma. For the preparation of the Khurma, a rectangular

wooden dye measuring 30 cm in length and 13 cm in width was selected. The lump of dough was flattened with the wooden roller. ‘Karai’, known as a frying stainless pan was used for frying. According to [5], Khurma is prepared by following the process shown below in the flowchart **Fig. 10**.

Table 4

Proximate composition of Khurma

Parameter	Khurma
Moisture	2.48±0.12 %
Fat	36.87±0.34 %
Protein	9.51±0.47 %
Total ash	0.48±0.03 %
Crude Fiber	0.06±0.01 %
Carbohydrates	50.60±0.82 %

**Fig. 10.** Preparation method of traditional Khurma

3. 7. Chiura (Baji)

Chiura is Newar’s most commonly used staple food item, also known as Baji in Newari languages. A typical Newari dish is incomplete without chiura which is served with different types of food items [28]. Chiura or Baji is very important in different festivals and rituals of Newars like “Chyanu Bicha” where Chyanu is an eight number and Bicha is a concern. This ritual is a marriage ritual done by the families of the bride after the main feast of the marriage [29]. From [2], chiura is pre-cooked beaten rice flakes with a crunchy character and is prepared form as a snack or as a full meal with different food items like pickles, meat, beans, eggs, vegetables, etc.

According to [2], the only ingredient used to make Baji or chiura is paddy and to make chiura the process is as follows **Fig. 11**.

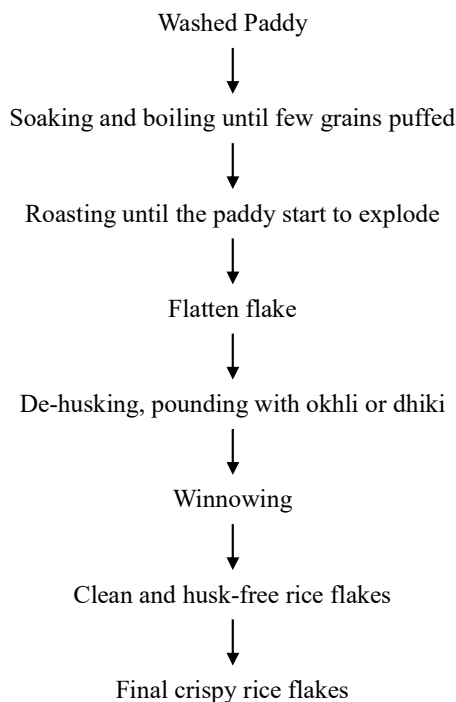


Fig. 11. Preparation of crispy rice-based chiura

3. 8. Lakhamari

Lakhamari holds significant importance within the Newar community, being a sweet bread prepared by mixing flour, sugar, and butter. The batter is then shaped into various figures such as fish frog and parrot before frying in butter. Once fried, the bread is coated with a thin sugary syrup called chasni. Lakhamari is considered an essential ceremonial food, particularly during the wedding, where it is customary for the groom to present multiple Lakhamari to its bride's family. The size of the Lakhamari symbolizes the closeness of the relationship with the bride's family, reflecting the strength of the kinship bond. Additionally, smaller Lakhamari are also made for everyday consumption, catering to guests and children. Other sweet breads like gulmari and anarash are also enjoyed during marriage ceremonies [23].

3. 9. Health benefits

In the human diet, cereal-based foods have been the foundation for centuries. Cereals provide all the macronutrients (proteins, fats, carbohydrates) and minerals, vitamins, and other micronutrients [30]. Cereals are regarded as staple foods that are high in calories, fiber, and protein, making them essential components of a nutritionally balanced diet. Furthermore, they contain numerous bioactive compounds that are known to fight against chronic disease [31]. Wheat, rice, maize, barley, oats, rye, millet, and sorghum are the most common cereals consumed worldwide. Apart from being an important part of the diet, these cereals are also high in a variety of health-promoting nutrients [32]. Over the past ten years, whole-grain foods and cereals have drawn a lot of attention from the scientific community, the government, and the commercial sector as epidemiological studies have demonstrated their ability to reduce the risk of numerous chronic diseases [33].

Future perspective and challenges.

The prospects of Newari traditional food present a mix of opportunities and challenges. Newari traditional food is rich in heritage, and flavor, and its unique culinary experience holds cultural significance. As global interest in diversity grows, Newari dishes have the potential to gain international recognition, leading to increased tourism and cultural exchange. This can contribute to preserving and promoting the Newari traditional food. To ensure the continued vibrancy of

Newari cuisines, efforts should be made to raise awareness about its cultural value provide culinary education, and support local producers of key ingredients.

4. Conclusions

Historically, Nepal has prepared and consumed various types of traditional local dishes that are based on different types of agro-plants depending on the varying agro-climatic conditions of that particular region. Traditional foods can help supplement the lack of seasonal food and nutrients and improve the quality of life. Producing traditional foods can be a useful way of increasing the value of raw materials, generating income as a means of livelihood, and preserving. Cereals such as wheat, maize, rice, oats, etc. are increasingly used to prepare foods that resemble traditional foods and are part of a typical diet, but they also have the benefit of supporting physiological processes in addition to being a source of nourishment. To retain the benefits to human health, it is also important to find the best processing methods for preserving nutrition in foods during baking and cooking procedures. The fusion of technology with traditional Newari dishes represents a bridge between age-old culinary practices and modern innovations. Through the integration of advanced techniques in food processing, packaging, and preservation, the essence of these cherished Newari dishes can be safeguarded while meeting contemporary standards, of efficiency and safety. With this blend of culture and technology, Newari dishes can be appreciated locally and globally while preserving the authentic flavors.

Conflict of interest

The authors declare that they have no conflict of interest in relation to this research, whether financial, personal, authorship or otherwise, that could affect the research and its results presented in this paper.

Funding

The study was performed without financial support.

Data availability

The manuscript has no associated data.

Use of artificial intelligence

The authors confirm that they did not use artificial intelligence technologies when creating the current work.

Acknowledgments

Authors are highly thankful to the Newari society and their people for supporting us in providing knowledge regarding the traditional dishes of their culture. With the help of Newari society, we can taste such unique, nutritional, and tasty traditional cuisines.

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Received date 07.09.2023

Accepted date 13.11.2023

Published date 30.11.2023

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How to cite: Magar, R. P., Shrestha, G., Kandel, K., Lamichhane, B., Thapa, B. L., Thagunna, B. (2023). Traditional cereal-based dishes of the Newari community of Nepal and their preparation process. EUREKA: Life Sciences, 6, 37–50. doi: <http://doi.org/10.21303/2504-5695.2023.003192>