ISSN: 2754-477X

Journal of Food Technology & Nutrition Sciences

SCIENTIFIC Research and Community

Review Article

Open Access

Functional Edible Tableware

Radhika CR* and Reginold Jebitta

Kalasalingam Academy of Research and Education, Krishnankoil, India

***Corresponding author**
Radhika CR, Kalasalingam Academy of Research and Education, Krishnankoil, India.

Received: September 06, 2024; **Accepted:** September 12, 2024; **Published:** September 19, 2024

Edible table wares are plate, cups, spoon, fork, chopsticks and cutleries that are edible. They are commonly made from dried millet powder (sorghum, jowar), wheat and rice. The properties like flexibility and nutritional value are more desirable to make edible cutleries. The inclusion of rice flour has hygroscopic and thickening properties, that enhances the cohesive strength of the cutleries. Additional incorporation of powdered fruit peels like kiwi, pomelo and dragon fruits adds nutritional value and beneficial properties, such as antioxidants and antimicrobial activity.

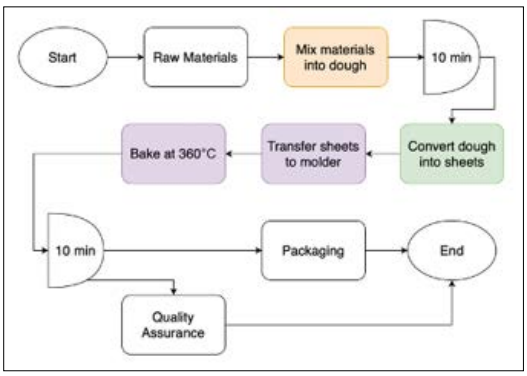
The spoons and forks made from millets do not get soggy even if they are placed in water and food. They just get soften in 10-15 mins and it degrades easily in 5 to 6 days. Plate bowl, chopsticks made from biscuit flour, water, table salt, shortenings, yeast, they last up to 45 days from purchase [1].

Edible cutleries made with pearl millets, offers high nutritional value in terms of energy, dietary fibre, protein, vitamins, minerals, and antioxidants. Similarly, wheat and rice flour contribute to the cohesive strength of the edible cutleries, with rice flour's hygroscopic nature aiding in better bonding between particles. Finely powdered rice flour enhances cohesive strength, and its thickening properties contribute to the preparation process of edible cutlery. Banana blossom and jaggery are good ingredients with wheat and millet flour to make edible cutlery. The banana blossom and millet are good sources of fibre and ash. Wheat flour and rice flour are capable of forming gluten network and starch water-bonds that retains moisture well. The gluten content gives the grains elastic toughness and helps in maintaining shape while baking [2].

Wheat Cutlery

One of the main raw materials used for the production of biodegradable tableware is starch and corn bran. Amino acids in the composition of corn bran are both a source of nitrogen and carbon. As a nutrient medium, up to 4% nitrogen can be obtained from corn extract in relation to 100 g product. Corn dishes have beneficial properties like B vitamins, Thiamine, Pantothenic acid, Folic acid [3].

Alternative materials such as plant waste byproducts are also being exploited to produce biodegradable packaging material and edible cutlery. Soy protein extracted from soy bean as a plant byproduct exhibit biodegradable and compostable properties. Soy protein-based cutlery cannot withstand high mechanical strength but it can be improved by utilising natural fibres from plant byproducts (morning glory stem fibre) and fresh vegetable waste. Preparation of green composites or cutlery using plant protein and plant fibre have good features like low cost, lightweight, abundant, biodegradable [4].



Flow Chart of Preparation of Edible Table Ware

Functional ingredients (ashwagandha root powder) addition in cutlery flour increases its nutritional and health benefits. The proximate composition edible cutlery shows increase in moisture, fat, crude fibre and ash content. The addition of moringa oleifera to the millet and corn flour gives beneficial properties to the cutlery. It acts as food fortificant in the stiff dough, bread, biscuit, yogurt, cheese and in making soups [5].

An edible jar or container can be made using dehydrated food sheet consist of dehydrated fruits and vegetables. It is shaped into jar capable of retaining liquids for lengthy period of time without leaking. It can accommodate low viscosity liquids for long period of time and can be put on a flat surface without assistance [6].

Edible bowls fabricated with natural ingredients like finger millet, refined flour, jaggery and xanthan gum can be fortified (brewers spent grain). It gives fivefold low water absorption and threefold oil absorption proficiency. The fortified bowl exhibit antioxidant activity and increased hardness.

Agar Based Edible Cups

The incorporation of natural pigments from extract of beetroot, spinach, jamun gives additional colour to the edible cutlery. It makes the cutlery more attractive without addition of food colourants. The collected beetroots, spinach and jamun fruit needs to be blanched at 102deg C for different time intervals. The pulp is collected by grinding them in mixer, extract pulp and strain using muslin cloth. This extracted juice is added to flour while preparation of dough instead of water.

The processing methods of edible cups for both common people and diabetic patients in compliance with their needs are different. While fabricating biscuit cups, we can use our own ingredients to prepare edible cups (different flavours) which depends upon the consumer's taste. An edible jar that can accommodate low-viscosity liquids for long periods of time and that can be put on a flat surface without assistance. One embodiment of this edible container consists of an edible dehydrated food sheet shaped into a jar capable of retaining liquid for lengthy periods of time without leaking and capable of being hand held; The dehydrated food sheet can consist of dehydrated fruit or dehydrated vegetables, including a handle and a lid.

Non-wheat edible spoons can be produced from a starchy natural food ingredient, formulated at 100%cassava (freshly grated), and 70%cassava& 30% Saba banana (freshly grated). This mixture formulations have the suitable characteristics needed to produce the intended product, the mixtures are both formable and moldable, which is made possible by the characteristics of the ingredient's starchy components. Also, the addition of the slimy grated banana has increased the ease in work-ability of the mixture. The developed edible spoon can be offered as an alternative with regards to the demand for single-use plastic spoons or to the increasing current demand for edible cutleries (Sorsogon multidisciplinary research journal) [7-12].

References

1. Natarajan N, Vasudevan M, Velusamy VV, Selvaraj M (2019) Eco-friendly and edible waste cutlery for sustainable environment. International Journal of Engineering and Advanced Technology 9: 615-623.
2. Thagunna B, Shrestha G, Karki R, Baral K, Kaur J (2023) Development and quality evaluation of biodegradable edible cutlery: a replacement for a conventional one. DEVELOPMENT 16: 2.
3. Qizi KMD (2022) Chemical Compositions of Biodegradable Disposable Tableware Based on Corn Bran. Universum: Chemistry and Biology 97: 45-49.
4. Choeybundit W, Shiekh KA, Rachtanapun P, Tongdeesoontorn W (2022) Fabrication of edible and biodegradable cutlery from morning glory (Ipomoea aquatic) stem fiber-reinforced onto soy protein isolate. Heliyon 8: 5.
5. Shabaana M, Firdouse TF, Prabha PH (2021) Development and Quality Evaluation of Eco-Friendly Moringa Oleifera Leave Powder Incorporated Edible Cutlery. International Journal of Advances in Engineering and Management 3: 160-166.
6. Kumar KS, Vikram S, Vigneswaran SJ, Sudhanhari CTA (2021) Manufacturing methods of healthy and edible cups-An integrative review. In IOP Conference Series: Materials Science and Engineering 1055: 012017.
7. Matheswari KB, Arivuchudar R (2024) Physiochemical and Sensory Properties of Edible Cups Conceptualized from Food By-Products. Biosciences Biotechnology Research Asia 21: 255-260.
8. Molu KR, Aneena E, Panjikkaran ST, Sharon C, Lakshmy P (2024) Standardization and Quality Evaluation of Wheat Flour Based Edible Tableware. The Journal of Research ANGRAU 52: 94-102.
9. Siddiqui B, Ahmad A, Yousuf O, Younis K (2023) Exploring the potential of mosambi peel and sago powder in developing edible spoons. Sustainable Food Technology 1: 921-929.
10. Srivastava A, Siddiqui S The Therapeutic Edges of Medicinal Plant-Derived Cutlery.
11. Torabi A, Mohebbi M, Tabatabaei Yazdi F, Shahidi F, Khalilian Movahhed M (2020) Application of different carbohydrates to produce squash puree based edible sheet. Journal of food science and technology 57: 673-682.
12. Habla FA, Estrada JP, Fulgar ED, Hamos EDP, Escopete AJ (2023) Development of Non-Wheat Edible Spoon. Sorsogon Multidisciplinary Research Journal 1: 1-12.