Kalpa Krunch Ready-To-Eat Snack

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Coconut milk residue (CMR) is a main co-product of coconut processing including coconut milk powder production, virgin coconut oil, flavored coconut milk and coconut milk yogurt based processing industries. It is a rich source of poly phenols and dietary fiber (*Trinidad et al., 2007*). The proximate composition of coconut milk residue flour is crude fiber (25.51%), dietary fiber (46.50%), crude fat (49.24%) and crude protein (5.29%) respectively (Manikantan, Ambrose, & Alavi, 2015). Nevertheless, CMR is mostly underutilized as animal feed or thrown as waste (Manikantan, Arivalagan, Mathew & Hebbar, 2015). Incorporation of coconut milk residue in our food could go long way in meeting our physiological and nutritional requirements (Manikantan, Ambrose, & Alavi, 2015). Published reports reveal that consumption of high fiber coconut flour products increase the fecal bulk and lower the serum cholesterol (*Gunathilake et al., 2009*). It provides numeral health benefits in the prevention of coronary heart diseases, colon cancer, and diabetes (*Trinidad et al., 2007*). Furthermore, coconut milk residue obtained after milk extraction possess good nutritional properties which could be utilized for value addition of various processed foods.

Most popular junk foods contain very high levels of trans-fats, salts and sugar - which inevitably leads to severe ill health and diseases like obesity and diabetes. Commercially available extrudates are usually developed from cereal flour. They tend to be low in essential amino acid content with a poor biological value and are coated with synthetic flavors and color. Hence, nutritious snacks can be produced by incorporation of coconut milk residue since it is rich in dietary fiber and polyphenols.

Fig 1. Line extrusion unit installed at ICAR-CPCRI for production of Kalpa Krunch

Machineries required for production of Kalpa Krunch (Capacity 5 to 15 kg/h)

Sl. No	Item	Quantity	Unit price (Rs.)	Total cost (Rs.)
1.	Twin screw extruder	1	2100000	2100000
2.	Ingredient mixer	1	100000	100000
3.	Coating machine	1	200000	200000
4.	Packaging machine (Form fill seal system)	1	300000	300000
5.	Mechanical dryer	2	200000	400000
6.	Pulveriser	1	100000	100000
7.	Miscellaneous items such as stainless steel containers, SS containers with trolley attached and other vessels, weighing balance, moisture meter, etc.,	-	100000	100000
	Total cost			33,00,000

Extrusion

Extrusion technology is a most adaptable and economical method due to continuous nature, short processing time, energy efficiency and absence of effluents to formulate new cereal -based snacks in variety of shapes (*Kowalski et al., 2016*). Extrusion has been used to produce a variety of foods such as ready-to-eat cereals, textured vegetable protein, and animal foods. In extrusion process, the desirable ingredients are subjected to high mechanical shear, drag, friction, and compression forces (*Pandiselvam et al., 2019*). Therefore, moistened starchy, fibrous, and protein materials are worked into viscous dough before being forced through the die (Lazou and Krokida, 2010).

Kalpa Krunch

ICAR-CPCRI has developed a technology for the utilization of coconut milk residue to develop a ready-to-eat extrudates and named as "Kalpa Krunch". This technology has been commercialized to two entrepreneurs.

Kalpa Krunch Production Process

The various steps involved in Kalpa Krunch production are mixing the ingredients (coconut milk residue and cereal flours), addition of moisture (14-16%, w.b.), extrusion (co-rotating twin screw extruder), drying, flavour coating and packaging. The process flow is described below,

Kalpa krunch is prepared by using rice flour, corn flour and coconut milk residue. It is coated with natural and healthy flavors. The flavors are formulated from ten different types of spices and vegetables including coriander, garlic, turmeric, clove, cinnamon, chilli, mint, cardamom, tomato and celery. Kalpa Krunch is rich in dietary fiber, protein, fat and carbohydrate with antioxidant activity. It is crispy and puffy in nature. Hence, Kalpa Krunch is a healthy, nutritious and crunchy snack food for all. Apart from that the underutilized coconut milk residue will fetch a decent market price if it is converted to extrudates, it add to boost the income of the coconut growers and virgin coconut oil manufactures. ■

Retired

Shri. Supriya Guha retired from the service of Coconut Development Board on 31st October 2019. He has served the Board for more than 33 years.