READY-TO-TRANSFER MILLET TECHNOLOGIES

Golden Opportunity for Food Entrepreneurs to Commercialize Millet Technologies

NATIONAL RESEARCH DEVELOPMENT CORPORATION

Under DSIR, Ministry of Science & Technology, Govt. of India

20-22, Zamroodpur Community Centre, Anusandhan Vikas, Kailash Colony , New Delhi-110048

Sr. No	POTENTIAL TECHNOLOGIES FOR COMMERCIALIZATION	DESCRIPTION PROFILE
A.	***Category: Processed Food millet technologies***	
1.	**GLUTEN FREE BREAD PREMIX-PROSO MILLET/FOXTAIL/BARNYARD** 	The use of standardized mixes and premixes in food manufacturing reduces the number of raw materials required, simplifies the production process, shortens preparation time, and minimizes the chances of formulation errors. Such products are increasingly relevant due to the growing demand for gluten-free foods, particularly for individuals suffering from celiac disease, an autoimmune disorder affecting the small intestine that requires strict avoidance of gluten for symptom management. The technology involves the use of millet flour, valued for its nutritional properties, blended with other essential ingredients required for the preparation of gluten-free baked products. The flour, with a particle size of approximately 300 microns, is mixed thoroughly with the ingredients to obtain a uniform premix. The prepared composite is then packed in MET-PET-PE laminated pouches to maintain product quality during storage. Quality evaluation confirms that the premix maintains good shelf stability of up to 75 days, making it suitable for commercial production and convenient for consumer use.
2.	**MILLET BASED COOKIE**	Millet cookie is made from a fine flour of millet with leavening and shortenings. There exists, however considerable potential for large scale manufacture and marketing of shelf-stable product utilizing underutilized grains like proso or foxtail millet as the demand for ready-to-eat convenience food products has been steadily increasing, consequent to industrialization and convenience in using. The product can be consumed during tea time or in between the meal. Shelf life of the product is about 6 months. Raw material : Proso millet/foxtail millet flour, Fat, Skim milk powder, Sugar etc.

		
3.	**RAGI/BAJRA/MULTI-MILLET COMPOSITE BREAD** 	Ragi / Bajra/Millet flour which is rich in many macro and micro nutrients when incorporated partly by replacing the flour can increase the nutritional value of the bread. This finely ground Ragi/ Bajra flour is blended with wheat flour and the dough is prepared. Further the dough is fermented, divided, proved, baked, sliced and packed. The technology can be utilized in the rural sector at the cottage/family scale units.
4.	**NUTRI MILLET BASED PROTEIN MIX POWDER (Multipurpose Application)**  Multigrain high protien mix  Multigrain high protien beverage	This is a novel technology developed using 100% natural and nutrient dense ingredients – whole grains (millets, cereals, pseudo-cereals and pulses) and provides 22% protein per serving. It is a multipurpose powder which can be reconstituted in hot/cold water/milk to prepare a millet beverage or can be mixed while preparing dough for roti or can be supplemented in bread/cakes etc. Salient Features of Technology • Provides 200-250 Kcal energy and 10 g protein per serving (50g) • Meets 22% recommended dietary allowances (RDA) of proteins • Meets 10% RDA of dietary fibre • Meets 15% RDA of Iron and calcium • Plant Based ingredients

5.	**MULTIGRAIN MILLET BASED PASTA** 	The developed multigrain pasta formulation (based on millets, durum semolina and permitted additives) could be used to supplement the nutritional requirements of growing children and adults. The multigrain pasta has increased fiber and mineral content by 4-5% compared to normal pasta. It can be consumed along with tastemaker as a breakfast cereal/snack.
6.	**GLUTEN FREE FOODS FROM BUCKWHEAT**  **Groats**  **Bar**  **Noodles**	Buckwheat, a pseudo-cereal, is a gluten free crop that belongs to the family of *Fagopyrum*. Buckwheat grains can be processed to variety of ready to eat (RTE) products and as bulk ingredients that can be mixed with other foods. **Salient features of the technology** - Buckwheat flour and puffs as gluten free replacers in RTE foods - Processes standardized for instant products such as noodles, pasta and extruded snacks - Products are free from additives and chemical preservatives - Buckwheat products contain beneficial polyphenol – Rutin up to 0.4% of dry weight - Average shelf-life of Buckwheat products is greater than 4 months
7.	**INSTANT BEVERAGE MIX POWDER FROM RAGI** 	Ragi is known to contain good amount of calcium and sulfur amino acids. Besides, ragi in the malt form can be an excellent cereal base for products like beverages and hence preparation of an instant beverage based on ragi malt was developed. It was blended with a small proportion of barley & protein concentrate to make a product with a desirable nutritional profile. Contains about

		14% protein compared to 8-9% of the market sample. Contains about 500 mg/100g of calcium (almost of 1/3rd of the RDA) from the natural source.
8.	**CONVENIENCE FLOUR FOR MUDDE/INSTANT MUDDE MIX**  	The convenience flour is suitable for the preparation of stiff porridge (mudde). The flour can also be conveniently used in the preparations like roti and such other products. The convenience flour should be packed in containers, which will safeguard the hygienic, nutritional and organoleptic qualities of the product. Product should be stored in cool and dry place.
9.	**MULTI GRAIN MILLET BASED READY-TO-COOK SWEET MIX (HALVA)**	Ragi/Sorghum/wheat, and rice, pulse and nuts based ready to cook mix for preparation of halva. Process involves grain size reduction, hydrothermal and thermal treatment and blending with ingredients.

		
10.	**JOWAR/FOXTAIL MILLET FLAKES** 	It is suitable specially for preparing deep fat fried (chewda) products such as fried and seasoned mixture. It is also suitable for preparing toasted and seasoned mixtures, energy food, tamarind bhath, upma, sweet/savory, pongal, sweet gravy (payasam), etc. For the preparation of bhath the flake thickness should be about 0.5 mm and about 0.8 mm to 1.0 mm for the preparation of chewda.
11.	**FLAKED JOWAR RTE LOW FAT SWEET & SAVOURY SNACKS** 	The jowar or sorghum snack is a ready-to-eat (RTE) product with either sweet or salt-spicy in taste. It is suitable as a low-fat snack because the step of frying in oil fat has been omitted to provide a good shelf-life without sacrificing the attractive taste and texture of eating a crispy snack. The product is low in cost and can also be considered as a health food. The product can be stored for 4 months at ambient conditions with good shelf stability.
12.	**SHELF-STABLE JOWAR FLOUR** 	The major setback of storing of Jowar flour is the development of rancidity within few days of storage. The process developed involves a standardized process where in a shelf stable Jowar flour is obtained, which has a storage period of 6-8 months. The same process can be applied to other millet flours as well. The rotis prepared from the process flour is soft and lighter in colour, the dough also has better rolling properties. With the increased shelf life and quality characteristics, the product can be manufactured and marketed as a regular commodity like maida, ragi flour etc.

13.	**INSTANT RAGI SEMOLINA** 	It is a ready mix for preparation of instant porridge, upma, keshribath or like some other breakfast foods. It is made from cereal like ragi, rice, maize, jowar, foxtail millet, proso millet etc. The product can be introduced as the multigrain instant semolina. The process allows the creation of a slow digestible instant product suitable for obese, overweight and weight watchers. The process provides a healthy food product, which is low in fat but rich in protein and dietary fiber. The semolina product can be shelf stored for more than 4 months at ambient conditions.
14.	**DECORTICATED RAGI** 	Finger millet or ragi has an outer seed coat which is colored and fibrous in nature and affects the eating qualities of the product. These limitations have been overcome by adopting the process which removes or decorticates the seed coat and result in spherical grains. The decorticated ragi cooks within 5 min. in boiling water and the grains retain their shape with soft texture even after cooking. The cooked grains are suitable for consumption similar to rice along with sambar or can be seasoned with spice to prepare chitranna or tamarind rice. Alternately, the decorticated millet could be cracked to soji or semolina. It can also be popped to prepare the product similar to 'rice poori' or expanded rice or could be flaked for use as breakfast cereal.
15.	**MALTED RAGI FLOUR-ENZYME RICH** 	Malted ragi flour can be used in preparation of weaning food, infant food, geriatric food, medical foods and also as milk based as well as alcoholic beverage formulations. It can be used as amylase rich food (ARF) to reduce the 'dietary bulk' of energy food and such other supplementary foods. By-products of this technology process such as seed coat & rootlets can be utilized in Cattle and Poultry feed formulations.
16.	**COMPOSITE RAGI RUSK**	A rusk is a hard, dry biscuit or twice-baked bread. It is sometimes used as a baby teething food. It is a popular baked product liked by all, especially children and working class, both in rural and urban sector. It is also

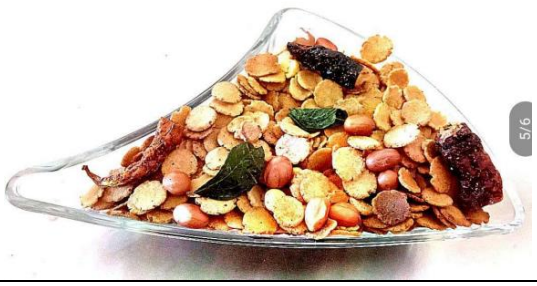
		a tea time snack which is yeast leavened containing 50% of 95% extraction ragi flour along with wheat flour. The crumb is pinkish brown colour, pleasant flavour and crisp texture with a moisture content of about 4%. Raw material required are Ragi flour, Wheat flour, Yeast and yeast food, Sugar, Salt, Hydrogenated bakery fat etc.
17.	**COMPOSITE MILLET VERMICELLI** 	Composite vermicelli made out of different grains or millets can catch market as it would give a touch of local taste. Ragi is particularly rich in calcium, contributes greater percentage of dietary fibre and it is specially advised as a food for patients suffering from diabetes. The processing of ragi vermicelli is similar to that of normal vermicelli production. Product can be used as food item breakfast as well as snack.
18.	**PROTEIN RICH SOY-RAGI VERMICELLI** 	Noodles or vermicelli are popular ready to cook products, normally prepared from wheat worldwide. There is growing interest on noodles from millets due to their nutraceutical content and the health benefits. Hence, noodles based on ragi (finger millet) with defatted soy flour were developed. Raw materials required are Ragi, soy flour, starch, etc. Apart from the procedure of manufacturing quality control, packaging and packaging material specifications, equipment details are also provided by NRDC.
19.	**RAGI PAPADS**	It is a ready-to-fry crisp snack food adjunct. It is made from cooked dough containing cereal flour like ragi, rice, maize, sorghum, wheat flour or sago either alone or as blends with other pulse flours along with salt, khar and spices. It is deep fat fried to an attractive

		crispy wafer like product that is commonly used as an adjunct to a full meal.
20.	**RAGI MURUKKU MIX** 	It is a ready mix for preparation of murukku, made from cereal flour either alone or blending with pulse flours. The blend after mixing with salt and spices is made into dough and deep fat fried to an attractive crispy snack. Even though the product is all time snack, it is commonly used as an evening snack along with tea/ coffee. Since, the product is an energy rich snack; it is an ideal snack for school children. The shelf-life of the mix is nearly 6 months with FFA content less than 10% when stored at ambient conditions.
21.	**RAGI FLAKES** 	Finger millet flakes are ready-to-use convenience products similar to rice, wheat and sorghum flakes. The flakes could be wetted with water and seasoned with spicy condiments, or sweetened for consumption as snacks. The thicker grade flakes may be deep fat fried or toasted to crispy textured products, and ready-to-eat snacks. The broken and pulverized flakes can be mixed with legumes and other ingredients to prepare traditional foods like bisibele bhath, idli and such other products. These flakes can also be used after toasting or blistering similar to corn flakes.
22.	**FINGER MILLET INSTANT KICHADI MIX**	Finger millet (ragi) is a nutrient-rich grain containing dietary fiber, essential minerals, vitamins, and beneficial phytochemicals such as phenolic compounds that support various health benefits. However, the wider adoption of millets in daily diets has been limited due to the lack of convenient and

		scalable processing options. The Finger Millet Instant Khichadi Mix has been developed to provide a nutritious and quick meal solution by combining finger millet semolina with green gram semolina, edible oil, and selected spices. With increasing consumer awareness about healthy foods and the rising prevalence of lifestyle-related diseases, this product offers a wholesome alternative to conventional ready-to-cook meals and presents strong potential in the growing health and wellness food market.
23.	**MILLET AND MULTI-MILLET PUTTU PODI MIX** 	Millets are highly nutritious grains rich in dietary fiber, essential minerals, vitamins, and bioactive compounds such as phenolics that contribute to various health benefits. Puttu is a traditional breakfast dish popular in the South Indian states of Kerala, Tamil Nadu, and parts of Karnataka, typically prepared from coarsely ground rice layered with grated coconut and steamed in cylindrical molds. The Millet and Multi-Millet Puttu Podi Mix has been developed as a healthier alternative to conventional rice-based puttu by using semolina (rava) derived from millets such as foxtail, little, proso, barnyard, and kodo millet. The multi-millet formulation provides improved nutritional value while retaining the traditional taste and texture of puttu, offering a wholesome and convenient breakfast option for health-conscious consumers.
24.	**SHELF-STABLE MILLET ROTI**	Cereal or millet roti is made from cooked dough containing the cereal or millet flour alone or as blends with other pulse flours. It is ready to eat shelf stable unleavened flat bread. There exists, however considerable potential for large scale manufacture and marketing of shelf – stable roti/ chapati, as the demand for ready to eat convenience food products has been steadily increasing, consequent to industrialization and convenience in using. The product can be consumed during meal time. In addition, the products are cost – effective and can also be considered as a health food (low fat high protein). The product can be shelf stored for

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<tr><td></td><td></td><td>twelve days at ambient condition or 2 months at refrigerated condition.</td></tr>
<tr><td>25.</td><td>PROTEIN RICH FOXTAIL MILLET FLAKES

</td><td>The Foxtail millet flakes (two variants) are developed which are ready-to-use convenience products similar to rice, wheat, sorghum and other cereal flakes but with enriched protein content. The flakes could be wetted with water and seasoned with spicy condiments or sweetened for consumption as snacks. The thicker grade flakes may be deep and fat fried to prepare crispy ready-to-eat snacks. Flakes can be consumed along with hot milk as breakfast cereals and also in masala form of flakes as healthy snacks. Raw Materials used are Foxtail Millet, Sugar, spices, Vitamins and Minerals for preparation.
Cost of the product: Rs. 280-300.
<table><tr><th colspan="2">Nutritional Composition*</th></tr><tr><td>Protein</td><td>11.32 (g)</td></tr><tr><td>Fat</td><td>0.85 (g)</td></tr><tr><td>Carbohydrate</td><td>75.65 (g)</td></tr><tr><td>Energy</td><td>356 (Kcal)</td></tr><tr><td>Fiber</td><td>7.21 (mg)</td></tr></table>* per100g</td></tr>
<tr><td>26.</td><td>PROTEIN RICH LITTLE MILLET FLAKES</td><td>Nutritious protein rich extruded flakes (two variants) can be used both as a breakfast cereal and tasty, crispy snack. Ingredients used for the development are Little Millet, spices, Sugar, Vitamins and Minerals.
Cost of the product: Rs. 280-300.</td></tr>
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	 	**Nutritional Composition*** Protein 10.81 (g) Fat 0.91 (g) Carbohydrate 77.84 (g) Energy 363 (Kcal) Fiber 6.84 (mg) * per100g
27.	**PROTEIN RICH SORGHUM FLAKES** 	Nutritious extruded flakes with 12% protein content that can be used both as a breakfast cereal and tasty, crispy snack. Ingredients used for the development are sorghum Millet, spices, Sugar, Vitamins and Minerals, SPI, WPI etc. Cost of the product is Rs. 280-300.
28.	**PROTEIN RICH MASALA MILLET FLAKES** 	A tasty, spicy and nutritious snack item that can be relished by all. Can be prepared in short time. Ideal for working couples. This mixture of masala flakes can be used as healthy snack with the addition of spice mix, peanuts etc. Cost of the product is Rs. 280-300.
29.	**PROTEIN RICH WHITE RAGI FLAKES**	White Ragi Flakes rich in protein, calcium and Zinc can be consumed along with hot milk as breakfast cereals and also its masala variant can be used as healthy snacks.

		
30.	**JOWAR SOOJI/RAVA**  **Sooji** **Rava**	Utilization of sorghum as food is limited mainly due to lack of innovative processing technologies at commercial scale. Hence, process is developed to produce the semolina from sorghum with higher yield and different granulation.
31.	**BAJRA SOOJI/RAVA** 	This is a protected technology with patent. Pearl millet serves as a major staple food for many populations around the globe. Utilization of Pearl millet as food is limited mainly due to lack of innovative processing technologies at commercial scale ✓ Hence process is developed to produce the semolina from Pearl millet with higher yield and different granulation. Approx. 39 Rs./Kg cost of Production with 6tons/day capacity of plant. The developed semolina can be used for several applications like for making upma, idli, dosa, uttapam, halwa, porridge etc.
32.	**100% MULTI-MINOR MILLET SEMOLINA** 	Any minor millet can be converted into semolina with different granulation after polishing into sooji and rava. Sooji is of larger particle grade and can be used for preparation of upma where as rava has lower particle size and can be used for the preparation of halwa. Technology for Foxtail millet semolina, little millet semolina, kodo millet semolina and proso millet semolina is developed for commercialization.
33.	**MULTIGRAIN GLUTEN FREE SEMOLINA (SOOJI / RAVA)**	The developed multigrain gluten free semolina (sooji / rava) product features a

		combination of millets and legumes with a beneficial nutritional profile. In India, there is need to develop the nutritious tradition products for the people suffering from celiac disease. Developed Multigrain gluten free semolina forms an important basic raw material in the preparation of several Indian traditional food products such as sweet and savory breakfast foods like upma and halwa.
34.	**MULTIGRAIN GLUTEN FREE INSTANT HALWA MIX**  	Multigrain gluten free halwa mix is convenient ready to cook breakfast food for celiac patients. The developed multigrain gluten free instant halwa mix product features a combination of millets and legumes semolina. The demand for multigrain gluten free instant halwa mix is expected to increase due to increasing cases of celiac disease in India

35.	**MULTIGRAIN GLUTEN FREE INSTANT RAVA IDLI MIX** 	Multigrain gluten free instant rava idli mix is convenient ready to cook breakfast food for celiac patients. ✓ The developed multigrain gluten free instant rava idli mix product features a combination of millets and legumes semolina. ✓ The demand for multigrain gluten free instant rava idli mix is expected to increase due to increasing cases of celiac disease in India
36.	**MULTIGRAIN GLUTEN FREE INSTANT UPMA MIX** 	Multigrain gluten free upma mix is convenient ready to cook breakfast food for celiac patients. The developed multigrain gluten free upma mix product features a combination of millets and legumes semolina. The demand for multigrain gluten free instant upma mix is expected to increase due to increasing cases of celiac disease in India
37.	**READY-TO-COOK MALTED WEANING FOOD BASED ON NUTRI-CEREALS** 	Weaning food is a semi-solid food given to an infant in an age group of 6 months to 2-3 years. Weaning foods are generally texture modifications of adult foods to make them easily digestible and promote healthy growth of a child. Wheat and ragi exhibit excellent malting characteristics, while rice is known for easy digestibility. Malting all these three cereals and combining them uniquely, improves both the taste and nutritional quality of the end product. Weaning foods based on malted cereals are still scanty in the present market. Supplementing malted cereal with malted legume generally increases both the quantity and quality of the proteins of the

		final product. Raw Materials required are Paddy, wheat, ragi green gram, milk powder etc.
38.	**RTE SNACK MIX (From Puffed Coarse Millet Cereals &Legumes)** 	Coarse grains like sorghum, bajra and grain amaranthus are nutritionally comparable and sometimes score over the major cereals. These grains possess unique nutritional characteristics specifically, they are gluten free, and have complex carbohydrates, rich in dietary fiber as well as unique phenolic compounds and minerals. All the grains are popped and powdered. The product can be used by reconstituting either water or milk or can be shaped into balls or burfi of 25 gm each. The product can be consumed by people of all age groups. Raw materials used are millets, pulses, oil seeds, additives, etc

39.	**PROTEIN AND FIBRE ENRICHED MILLET BARS** 	One of our premier laboratories have developed a low cost technology for commercial production of protein and fibre enriched cereal bars that meets at least 20% recommended dietary allowances (RDA) of protein and fibre. **Salient features of the technology** - Ready to eat food with 150 -200 Kcal energy per serving (40g) - Developed using 100% Natural ingredients like whole grains, millets, pulses, dehydrated fruits and nuts. - Preservative and additive free - 4 g fibre per serving - Low saturated fat content <2.5g/serving - No Processed sugar - Lower sugar content (<7 g) - Shelf life longer than 4 months - Added suferfoods like qunioa, flax, chia, spirulina - 10-15% Calcium requirement of RDA & 8% of Protein Requirement - Flavours customization possible: Chocolate, vanilla, cardamom, Mixed fruit, berry etc

40.	**MULTIGRAIN MILLET-CEREAL-LEGUME BAR**	Bar is a ready to eat sweet snack. Several types of cereal bars are commercially available and given different names, like food bars, energy bars, snack bars, granola bars, etc., each differing in ingredients and processing and texture. They ideally provide essential nutrients and possess a reasonable shelf life and hence, they also could be used as meal replacers. The present product contains multi grains including cereals, legumes and nuts and thus considered to be nutritious and are of soft and chewy type. Shelf life of the product is about 4 months. Raw material : Rice flakes, Ragi flakes, Sesame, Peanuts, Oat flakes, Soy flour, Honey, Ghee, Sugar, Guar gum etc. Puffed rice, jaggery, etc.
41.	**MILLET BHATURA MIX & MILLET DHOKLA MIX**  	There are no convenient mixes available for fermented and millet products. These mixes are handy and convenient for consumers. The products, dhokla and bhatura need fermentation time of three to five hours for their preparation to begin. However, the convenience mixes developed can be prepared within half an hour.

42.	**READY-TO-COOK MIXES (RAGI BASED)** 	Product Mixes Technology Available: **i) Millet Cookies Mix** **ii) Millet Roti Mix** **iii) Millet Ada mix** **iv) Millet Kheer Mix** **v) Millet Dosa Mix** **vi) Millet Pakoda Mix** **vii) Millet Halwa Mix** **viii) Millet Beverage Mix** **ix) Millet Functional Mix** **x) Spiced Millet Mix** **xi) Millet Functional Beverage Mix** **xii) Millet Choco chips** **xiii) Sweetened millet mix** **xiv) Millet Laddu Mix** **xv) Millet Nippattu Mix** **xvi) Millet Namakpara** Ragi based products developed to provide high calcium and dietary fibre in the diet. The specific millet called finger millet (ragi) is an anti-diabetic too. The product provides high convenience such as RTE or cold-water reconstitution. These products are good for skeletal health because of high 200-300 mg calcium content. Also good for easing constipation problem, controlling lipid profile because of 20 per cent dietary fibre content. Its constant use helps diabetic patients in controlling their disease.

43.	**MILLET CHILRA PREMIX AND VARIANTS (FINGER MILLET, BARNYARD MILLET, SORGHUM AND PEARL MILLET)**	A ready-to-cook premix developed for preparing nutritious millet-based chilra (savory pancakes) using millets such as Finger millet (Ragi), Barnyard millet, Sorghum (Jowar), and Pearl millet (Bajra). The formulation enables quick preparation while retaining the nutritional richness of millets, including dietary fiber, minerals, and complex carbohydrates. The premix is gluten-free, free from artificial additives, and designed for convenient preparation in household as well as institutional kitchens.
44.	**MILLET PANCAKE PREMIX AND VARIANTS**	This premix allows the preparation of healthy millet-based pancakes made from Finger millet, Barnyard millet, Sorghum, and Pearl millet. The product offers a nutritious alternative to conventional wheat-based pancakes, catering to the growing demand for gluten-free and functional foods. The premix ensures uniform taste, easy preparation, and enhanced shelf stability, making it suitable for domestic consumption, cafes, and health-food markets.

45.	**MILLET SOUP PREMIXES AND VARIANTS**	A range of instant soup premixes formulated with nutrient-rich millets such as Finger millet, Barnyard millet, Sorghum, and Pearl millet. The premixes provide high fiber, essential minerals, and natural energy, making them suitable for health-conscious consumers. The product is easy to prepare, shelf-stable, gluten-free, and free from synthetic additives, supporting convenient and nutritious meal options.
46.	**BARNYARD MILLET KHEER PREMIX (PUDDING PREMIX)**	A ready-to-cook dessert premix designed to prepare traditional kheer using Barnyard millet as the primary ingredient. The formulation offers a nutritious and gluten-free alternative to rice-based kheer, while preserving the authentic taste and texture of the traditional Indian dessert. The premix enables quick preparation, longer shelf life, and consistent product quality.

47.	**MIXED MILLET BEVERAGE PREMIX AND VARIANTS**	A nutritious beverage premix prepared from a blend of selected millets, designed to deliver balanced nutrition, natural energy, and digestive benefits. The formulation allows quick preparation of health beverages suitable for children, adults, and elderly populations. The product is gluten-free, preservative-free, and aligned with the growing demand for functional and traditional grain-based beverages.
48.	**MILLET PANJEERI**  Bajra Panjiri Swank Panjiri Jowar Panjiri Ragi Panjiri	Millet Panjeeri is an innovative gluten-free adaptation of the traditional panjeeri, a nutrient-dense food commonly consumed in the Western Himalayan region. Unlike conventional formulations that use wheat, this technology utilizes millets as the primary ingredient, making it suitable for gluten-sensitive consumers and health-conscious markets. The product contains no added preservatives or artificial additives and offers a shelf life of more than six months, while retaining the traditional flavor, nutritional richness, and cultural relevance of panjeeri.

Machine based Millet Technologies		
49.	**CONTINUOUS RAGI MUDDE MAKING MACHINE** 	This machine is very useful in big restaurants, hostels, industrial canteens, defense canteens, jails, airport restaurants etc. Ingredients required are ragi flour and water. Steam quality and other working parameters of the machine are maintained within the range by the control system of the machine. Unit is easy to clean and has provision for CIP (Clean in position) ensuring quality and hygiene. Unique features of the Machine include: - It is fully automated Machine - It is steam cooked inside the machine. - It is untouched by human elements. - Ragi flour and water is added to the machine, Ragi balls come out as continuous discharge with consistent shape and weight. - It can discharge 200 to 250mudde/ hr. (200 gm each ball weight). - Machine dimensions: 2.3m X 0.74m X 2.1m - AC motors: 2 no. (0.5 Hp and 0.25Hp), 3phase - DC Motors: 2 no. (40 watts each) with gear box. - Only one person is sufficient to operate the machine on continuous basis
50.	**HOT AIR POPPING MACHINE, USING FLUE GAS**	It is a dedicated pilot-unit for popping of maize, paddy, **jowar** and rice. The system is versatile, compact, rugged and economical. The process parameters of popping can easily be varied to suit different products. The process parameters like feed rare popping temperature; velocity of air can be varied easily and quickly. The product obtained is hygienic and free from sand, saw dust and ash. LPG is used as a source of heat energy and the product of combustion is eco-friendly i.e., H_2O and CO_2. The hot air is re-circulated in order to have higher thermal efficiency, and also to reduce the cost of processing. Presently popping is done in batches involving human drudgery and

		unhygienic practices. The cost of the unit is estimated at Rs.35,000 (Rupees Thirty Five Thousands only). Feed rate 25 Kg/hr
51.	**PEDAL OPERATED MILLET DEHULLER** 	This is pedal operated millet mill best suited for rural millet sector industries where there are power challenges. Speedometer is installed to standardize the speed for milling. Impact type dehusker and collecting chamber are installed to get the 70% milling efficiency. The unit can be easily assembled as all the components are available locally. The unit is easy to operate and maintain.
52.	**MOULDING MACHINE FOR BESAN, SOJI/ RAVA AND SIMILAR LADDUS**	This invention is useful for moulding of any food material, which ahs the property of binding particles together. The moulding machine can mould the food material in any geometrical shape such as sphere, square, rectangle, etc. The moulded food materials obtained by using this device of the present invention are of uniform dimension and geometry and are obtained in a continuous manner. The food material can be used, such as laddu granules, blended soji with sugar and fat, roasted besan with sugar and fat are few combinations to mention. The device of the present invention is therefore useful as a moulding machine for laddu,

		besan laddu, soji laddu etc. **Technical specifications:** Capacity of the machine : 2000 Nos./ hour Electrical heat lad : 1 Kwatts Material of moulding die : Stainless steel No. of moulding die sets : 4 Nos. Weight of the machine : 90 Kgs (Approx.) Floor space needed : 1.5 * 1.5 Sq. M Height of the machine : 1.5 M **Suggested capacity of the fabrication unit:** 10 machines per ann

Government Schemes on Millets for Entrepreneurs

1) https://mofpi.gov.in/announcements/guidelines-production-linked-incentive-scheme-millet-based-products
2) https://pmfme.mofpi.gov.in/pmfme/#/Home-Page

Support from NRDC

1) http://www.nrdcindia.com/Pages/Techno%20Commercial%20Support
2) http://www.nrdcindia.com/Pages/Priority%20Projects
3) http://www.nrdcindia.com/Pages/TDVC
4) http://www.nrdcindia.com/Pages/Patent%20Assistance
5) http://www.nrdcindia.com/Pages/Seed%20Funding
6) TTFC MSME Scheme

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