Technology Catalogue
Agro-Produce Processing Division
ICAR-Central Institute of Agricultural Engineering

Compiled by

Dr. S. Mangaraj | Dr. Adinath Kate

Dr. M. K. Tripathi | Dr. Dilip Pawar

Agro Produce Processing Division

ICAR-Central Institute of Agricultural Engineering

Nabi Bagh, Berasia Road, Bhopal – 462 038

Technology Catalogue
Agro-Produce Processing Division

ICAR-Central Institute of Agricultural Engineering

Compiled by

Dr. S. Mangaraj | Dr. Adinath Kate

Dr. M. K. Tripathi | Dr. Dilip Pawar

Agro Produce Processing Division

ICAR-Central Institute of Agricultural Engineering

Nabi Bagh, Berasia Road, Bhopal – 462 038

Catalogue No. CIAE/APPD/TB/2024/381
Mangaraj S., Kate A. E., Tripathi M. K., Pawar D. A., (2024). Technology Catalogue Agro-Produce Processing Division. ICAR-Central Institute of Agricultural Engineering – 462038, India.

Published by:
Director
ICAR-Central Institute of Agricultural Engineering, Bhopal – 462038, India
Telephone : +91-755-2521000, 2521001, 2737191 **Fax:** +91-755-2734016
E-mail: directorciae@gmail.com **Website:** ciae.icar.gov.in

PROCESSING MACHINERIES & TECHNOLOGIES

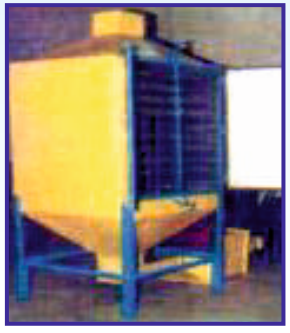
AGRO PRODUCE PROCESSING DIVISION,
ICAR-CENTRAL INSTITUTE OF AGRICULTURAL ENGINEERING

Name of the Technology	About the Technology	Major component/ dimensions	Performance Parameters	Advantages	Licensee
Manual Double Screen Grain Cleaner 	It is a batch type hand operated equipment to replace existing traditional practice i.e. manual sieving to clean the grains. It separates impurities like stubbles, chaff, dirt and broken from wheat, bengal gram, soybean and other cereals and pulses.	It consists of main frame scalper/ grading screen, draper rod, handle, shutter etc. and operated by hanging it on any elevated point with ropes.	Power Source: Manual Weight: 17.6 kg Capacity: 125-225 kg/h Cleaning Efficiency: 99 % Cost: ₹ 4500/-	• Reduce Drudgery. • Improved efficiency. • Increased capacity over manual practice.	• Ganga Industries AB Road, Dewas (MP) • Swastik Agro Industries, Industrial Estate, Rajnandgaon, (CG) • Laxmi Steel Fabs Near Satya Sai College, Sehore, (MP)
Grain Flour Separator 	This equipment is for separating milled wheat flour through a set of different sieves into bran, fine flour (Maida), semolina (Suji) and coarse flour (Atta). It is suitable for milled wheat, gram and soy flour.	It consists of a hopper, separation chamber with appropriate screens, shaking unit and outlets for respective screened material.	Power source: Electric Motor (0.75 kW) Weight: 127 kg Capacity: 80-120 kg/h Cost: ₹ 20,000/-	• Reduce Drudgery. • Improved efficiency. • Increased capacity over manual practice.	• GETECH Industries Hyderabad (TS) • Hira Krishi Udyog, Ratia, Distt. Fatehabad, (HR) • Shiv Ganga Enterprises, Hatia, Ranchi (JH) • Venkatesh Agro Engineering, Works Additional MIDC, Jalna, (MS)
Sack Holder 	It holds the sack in vertical open position for easy loading of cleaned grains and granular materials. Its height can be adjusted to the size of the sack and suitable for handling /bagging of all types of materials	Made up of MS angle of standard height of gunny bags.	Power source: Manual Weight: 11 kg Holding Capacity:100 kg Cost: ₹ 1000/-	• Reduce Drudgery. • Reduce the spillage losses during filling. • Reduced filling time over conventional manual practice.	• Laxmi Steel Fabs, Near Satya Sai College, Sehore, (MP) • Ganga Industries, AB Road, Dewas (MP) • Bindal Ispat Udyog Nagar, Delhi Road, Hissar, (HR) • GETECH Industries IDA, Cherlapally, HCL, P.O., Hyderabad- 51, (TS)

Name of the Technology	About the Technology	Major component/ dimensions	Performance Parameters	Advantages	Licensee
Tubular Maize Sheller 	It is a hand operated tool to shell maize grains from dehusked dried cobs. During shelling, sheller is held in one hand, a cob held in other hand is inserted into it with forward and backward twist to achieve the shelling.	The unit consists of galvanized octagonal mild steel pipe with four tapered fins riveted to its inner periphery.	Power Source: Manual Weight: 0.20 kg Capacity: 18-22 kg/h Cost: ₹ 75/-	• Reduce Drudgery. • Improved shelling efficiency. • Labour saving. • Increased capacity over manual shelling by hand.	• Maa Durga Plastic Products, MIDC Phase 3, Akola (MS) • Vasundhara Krishi Yantra Lambakheda, Bhopal (MP) • Metalweld Engineering PVT. LTD. Vijay's Nagar Indore (MP) • KGVK Agro Ltd., Bariatu, Ranchi, (JH)
Groundnut Decorticator 	Groundnut decorticator is an oscillatory type device having cast iron shoes with projections for decortication of groundnut pods. The pods are fed in batches. There are two models standing type and sitting type.	It consist of frame, handle, oscillating arm and sieve with oblong hole.	Power Source: Manual Weight: 10 kg Capacity: 35-40 kg/h Cost: ₹ 5000/-	• Drudgery reduction. • Eliminating the chances of injury to fingers of worker. • Minimum damage to nuts.	• Hira Krishi Udyog, Ratia, Distt. Fatehabad, (HR) • Shiv Ganga Enterprises, Hatia, Ranchi (JH) • Venkatesh Agro Engineering, Works, MIDC, Jalna, (MS) • Maa Durga Plastic Products, MIDC Phase 3, Akola (MS) • Magnificent Engineers SIDCO Industrial Estate, Kurichi, Coimbatore (TN)
Pedal-cum-Power Operated Double Screen grain Cleaner-Grader 	The machine clean the grains based on difference in terminal velocity of the different fractions of grain and accompanying material while classifying the food grains based on their difference in size. Suitable for all types of food grains.	It consists of main frame, hopper, feeding mechanism, sieve box, scalping and grading sieves, eccentric unit centrifugal blower, electric motor, bicycle drive unit etc.	Power Source: Electric Motor (0.375 kW) Weight: 100-110 kg Capacity: 900 kg/h (Power operated) 600 kg/h (Pedal operated) Cleaning Efficiency:78-80% Cost: ₹ 20,000/-	• Reduce Drudgery. • Improved quality of food grains. • Cost-effective operation. • Labour saving. • Increased capacity over conventional manual practice.	• Ganga Industries AB Road, Dewas (MP) • Swastik Agro Industries, Industrial Estate, Rajnandgaon, (CG) • Laxmi Steel Fabs Near Satya Sai College, Sehore, (MP)

Name of the Technology	About the Technology	Major component/ dimensions	Performance Parameters	Advantages	Licensee
Dal Mill 	The machine developed for dehusking and splitting of pulses like pigeon pea, black gram, green gram and lentil. The machine is operated in integration with standardized pre-treatment process protocol and grain cleaner cum grader. Whole pulse to be milled is first soaked in water (pre-conditioning), sun dried and later it is fed into the mill to achieve complete milling in two passes.	The machine consists of feeding hopper, carborundum rollers, concave and outlets for dal and broken/ powder.	Power Source: Electric Motor (1.5 kW) Weight: 90 kg Capacity: 100-110 kg/h Dal recovery: 72 % Cost: ₹ 20,000/-	• Increase in dal yield and improvement in dal quality. • Reduction in drudgery. • Potential rural employment generation. • Increased capacity over conventional manual practice.	• Swastik Agro Industries, Rajnandgaon (CG) • Laxmi Steel Fabs, Near Satya Sai College, Sehore (MP) • KPMC Technology Limited, Dewas Naka, Indore (MP) • Ganga Industries, AB Road, Dewas (MP) • Chaurasia Agro Industries, Soura, Chhatarpur (MP) • Vasundhara Krishi Yantra, Lambakheda, Bhopal (MP) • Manak Industries, Govindpura, Bhopal (MP) • Maa Durga Plastic Products, MIDC Phase 3, Akola (MS) • Metalweld Engineering Pvt. Ltd. Vijay Nagar, Indore (MP) • KGVK Agro Ltd., Bariatu, Ranchi (JH) • The Maharashtra Agro-Industries Development Corporation Limited. Prabhadevi, Mumbai (MS) • GETECH Industries Cherlapally, HCL, P.O., Hyderabad- 51 (AP) • Bindal Ispat, Udyog Nagar, Delhi Road, Hissar (HR) • Wegvan Industries, Agriculture Engineering Works, Alakhdham Nagar, Ujjain (MP) • Hira Krishi Udyog, Ratia, Distt. Fatehabad (HR) • Shiv Ganga Enterprises, Hatia, Ranchi (JH) • Venkatesh Agro Engineering, Works, Additional MIDC, Jalna (MS)

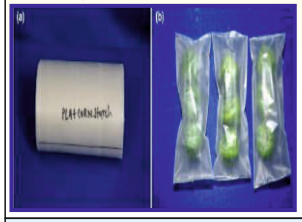
Name of the Technology	About the Technology	Major component/ dimensions	Performance Parameters	Advantages	Licensee
Millet Mill 	The machine is mainly developed for dehulling of minor millets. The dehulling of the grains takes place with the principle of abrasion and friction between the emery stones. The machine is suitable for dehulling of foxtail millet, little millet, kodo millet, proso millet, barnyard millet etc.	Mainly consist of feed hopper, dehulling unit, gap adjustment mechanism, cyclone assembly for cleaning the dehulled fractions, discharge chute.	Power Source: Electric Motor (0.75 Kw) Weight: 112 kg Capacity: 100-110 kg/h Dehulling Efficiency:>70% Cost: ₹ 20,000/-	• Produce high- quality kernels. • Single machine • Suitable for different millets • Higher dehulling efficiency.	• KPMC Technology Limited. Dewas Naka, Indore (MP) • Perfura Technologies India (Pvt.) Ltd., Coimbatore (TN) • Valampuri Industries PN Pudur, Coimbatore (TN) • AVM Engineering Industries, Meyyanoor Main Road, Salem (TN)
Potato Peeler 	The pedal operated potato peeler has been developed for small scale entrepreneurs where electricity is not available. The perforated stainless steel drums during rotation remove skin of potatoes.	The machine consists of two perforated SS drums, water jet sprays, pedal, handle, seat etc.	Power Source: Manual Weight: 75 kg Capacity: 180 kg/h (Power operated) 600 kg/h (Pedal operated) Cleaning Efficiency: 78-80% Cost: ₹ 17,000/-	• Reduce Drudgery. • Labour saving. • Suitable for pilot scale application • Increased capacity over conventional manual practice.	• Swastik Agro Industries Rajnandgaon (CG) • Laxmi Steel Fabs, Near Satya Sai College, Sehore (MP) • Ganga Industries, AB Road, Dewas (MP) • Vasundhara Krishi Yantra Lambakheda, Bhopal (MP) • Hira Krishi Udyog, Ratia, Distt. Fatehabad (HR) • Maa Durga Plastic Products, MIDC Phase 3, Akola (MS) • Shiv Ganga Enterprises, Hatia, Ranchi (JH) • Venkatesh Agro Engineering, Works Additional MIDC, Jalna (MS) • Global Engineers & Equipment, Bastin Bazar, Asansol (WB) • D K Agricultural Industry, Pitam Pura, New Delhi

Name of the Technology	About the Technology	Major component/ dimensions	Performance Parameters	Advantages	Licensee
Potato Slicer 	The machine is pedal operated used to make slices of the peeled potato tubers. The uniform size slices are made with sharp stainless steel blades. The peeled potatoes needs to be pressed through hopper during operation.	It consists of main frame, feeding unit, stainless steel blade etc.	Power Source: Manual Weight: 46 kg Capacity:50kg/h Cost: ₹ 17,000/-	• It is suitable for small-scale entrepreneurs where electricity is not available. • Uniform slice thickness. • Drudgery reduction. • Increased capacity over conventional manual practice.	• Swastik Agro Industries Industrial Estate, Rajnandgaon (CG) • Laxmi Steel Fabs, Near Satya Sai College, Sehore (MP) • Ganga Industries, AB Road, Dewas (MP) • Vasundhara Krishi Yantra Lambakheda, Bhopal (MP) • Hira Krishi Udyog, Ratia, Distt. Fatehabad (HR) • Maa Durga Plastic Products, MIDC Phase 3, Akola (M.S.) • Global Engineers & Equipment, Bastin Bazar, Asansol (WB) • Shiv Ganga Enterprises, Hatia, Ranchi (JH) • Venkatesh Agro Engineering, Works Additional MIDC, Jalna, (MS) • D K Agricultural Industry, Pitam Pura, Delhi
Vegetable Dryer 	This dryer is recommended for drying the vegetables like Cauliflower, Cabbage, Onion etc. The cabinet has twenty trays of wire mesh fitted on aluminium frame. The temperature in the drying chamber is controlled with the help of a thermostat. It is suitable for drying of all types of food materials.	It consists of drying chamber, plenum chamber, heating unit chamber and an air blowering device.	Power Source: Electric Power Weight: 175 kg Capacity: 50 kg/day Cost: ₹ 70,000/-	• Less drying time. • Uniform drying of the material. • Suitable for pilot scale application. • Better shelf life of the dried products.	• KGVK Agro Ltd. Bariatu, Ranchi, (JH) • Vedvyas Steel Industries, Vedvyas Chowk, Rourkela (OD) • Global Engineers & Equipment, Bastin Bazar, Asansol (WB)

Name of the Technology	About the Technology	Major component/ dimensions	Performance Parameters	Advantages	Licensee
Power cum Manual Operated Fruit and Vegetable Grader  	It is a size based grading machine in which the material is fed over the oppositely rotating diverging rollers. Along the length of rollers the diameter is decreasing in steps, thereby the opening space between the rollers is increasing which facilitates the sorting of the moving commodities in different size lots. The grader is suitable for spherical fruits and vegetables.	The major working components of the grader includes Feed hopper, feed conveyor, roller array, discharge channels.	Power Source: Electric Motor (0.74 kW) Weight: 100 kg Capacity: 2 t/h Grading Efficiency: 92-95% Cost: ₹ 50,000/-	• Best for spherical, free flowing fruits and vegetables. • Uniform and efficient size based grading • Reduced drudgery • Cost effective in operation. • Improved capacity over conventional practice.	• Shubham Agricultural Implements Private Ltd. Hardoi, (UP)
Stepwise Expanding Pitch Fruit Grader 	It is a commercial scale multi fruit grader suitable for grading different types of spherical shaped fruit. The grader has provision to separate fruits into five grades by adjusting flap spacing between 30 and 145 mm.	The fruit grader consisted of a grading unit, horizontal belt conveyor for conveying cum feeding, grading unit and discharge chutes.	Power Source: Electric Motor (0.74 kW) Weight: 100 kg Capacity: 5 t/h Grading Efficiency: 97% Cost: ₹ 1,00,000/-	• Commercial scale capacity. • Uniform and efficient size based grading • Reduced drudgery • Cost effective in operation.	• Shubham Agricultural Implements Private Ltd. Hardoi, (UP)

Name of the Technology	About the Technology	Major component/ dimensions	Performance Parameters	Advantages	Licensee
Modular Onion Storage Structure (Model-I and Model- II)  	The structure is foldable modular in nature. The storage unit equipped with sensor based automated aeration and fumigation system. The structure have arrangement for easy filling and automatic discharge system. The storage system is suitable to store rabi harvest of the onion during rainy season.	It is made from lightweight, corrosion and UV resistive FRP material.	Power Source: Electric Motor for forced aeration (0.372 kw) Capacity: 1 tonne (Model-I) & 3 tonnes (Model-II) Reduction in storage losses: 56 % over conventional practice. Cost: Rs. 20000/- Appx. (Model-I) Cost: ₹ 35,000/- Appx. (Model-II)	• Lower storage losses • Storage structure is rust proof & hence expected long life and durability. • Maximum retention of quality • Automatically controlled aeration system • Labour saving in handling operations • Better shelf life of store commodity	• GV Industries, 22-A, Industrial Estate, Dhar, (MP)
Ripening Chamber 	It is suitable for ripening of fruits like banana, mango and papaya using ethylene gas under controlled conditions of temperature and relative humidity.	The unit consists of polycarbonate sheet based chamber, ethylene gas generator, humidifier and air conditioner.	Power Source: Electric Motor (1.5 kW) Weight: 70 kg Capacity: 1 ton of fruits/ batch Temperature: 18±1^{0}C Relative Humidity: 90% Cost: ₹ 1,00,000/-	• No use of carcinogenic chemicals. • Safe and hygienic practice leading to better quality and shelf-life of ripened products	• Anand Hitech Solution, Arera Colony, Bhopal (MP) • Trigon Property, Management Services (P) Ltd., Subhash Chowk, Lakshmi Nagar, New Delhi

Name of the Technology	About the Technology	Major component/ dimensions	Performance Parameters	Advantages	Licensee
Millet Flaking Machine 	A compact machine developed to make millet flakes by pressing conditioned millets between two textured stainless steel rollers. The adjustable gap between rollers makes it suitable for use with different sizes of millets/cereals and other food/feed materials into variable thickness flakes.	Feed hopper, metering rollers, Array of rollers of SS 304 grade, acrylic inspection window helps to monitor the operation and cleaning the machine.	Power Source: Electric Motor (1.5 kW) Capacity: 100 kg/h Approx. Cost: ₹ 60,000/-	• Suitable to flaking major millets. • Compact machine. • Contact parts are made from food grade SS 304.	• Sri Balaji Industries, ELGI, Industrial Area, Trichy Road, Singanullur, Coimbatore, (TN)
Automatic soymilk plant 	In the plant, the boiler and cooker are connected by automatic pressure valve and released steam easily to the cooker at steam pressure of 5 kg and temperature of 150^{0}C. The automation valve opened when it developed desired pressure and temperature and soy slurry has been pumped to separator.	The main components of the soyamilk plant of capacity 100 l/h plants are (i) Feeding and grinding unit, (ii) Storage tanks, (iii) Boiler unit, (iv) Cooker, (v) Separators (vi) Pneumatic tofu press (vii) Control panel etc.	Power Source: Electric /LPG Capacity: 100 lit/h Pressure setting: 2.5 kg Temperature setting: 120^{0}C.	• Automated operation. • Soymilk of very good quality and taste an acceptable to consumers.	• Royal Plant Services, New Delhi (Delhi)

Name of the Technology	About the Technology	Major component/ dimensions	Nutritional Composition (g/100 g)	Advantages	Licensee
PLA (Poly Lactic Acid) + Corn Starch based Commercial Grade Biodegradable Film 	This biodegradable film was developed through commercial extrusion blown moulding method using PLA and corn starch. The developed film may be used for carry bags possibly used for handling of onion, pulses, clothes etc.	Major ingredient of the film includes PLA (Poly Lactic Acid) and corn starch.	Haze %: 83.23% Tensile Strength: 31.51 MPa OTR: 208.3 cc/ m^2/ day WVTR:83.33gm/ m^2 /day	• Naturally biodegradable. • Replacement to single use plastic. • No pollution. • Sustainable to environment, economy and society.	• Natures Bioplastic Pvt. Ltd., Hyderabad (TS)
PLA (Poly Lactic Acid) + Cassava Starch based Commercial Grade Biodegradable film 	This biodegradable film was developed through commercial extrusion blown moulding method using PLA and corn starch. The developed film may be used for handling of various agro commodities.	Major ingredient of the film includes PLA (Poly Lactic Acid) and cassava starch.	Haze %: 89.68% Tensile strength: 25.16 MPa OTR: 123.92cc/m^2/ day WVTR: 217gm/m^2 /day	• Naturally biodegradable. • Replacement to single use plastic. • No pollution. • Sustainable to environment, economy and society.	• Natures Bioplastic Pvt. Ltd., Hyderabad (TS)
PLA (Poly Lactic Acid) + PBAT(Polybutylene AdipateTerephthalate) based Commercial Grade Biodegradable film 	This biodegradable film was developed through commercial extrusion blown moulding method using PLA and corn starch. The developed film may be used for handling of various agro commodities.	Major ingredient of the film includes PLA (Poly Lactic Acid) and PBAT.	Tensile strength: 75.49 MPa OTR: 171.35cc/m^2/ day WVTR: 101.47gm/m^2/day	• Naturally biodegradable. • Replacement to single use plastic. • No pollution. • Sustainable to environment, economy and society.	• Natures Bioplastic Pvt. Ltd., Hyderabad (TS)

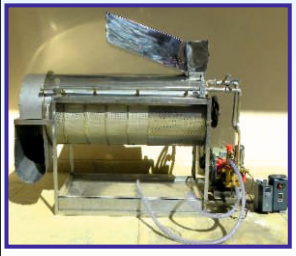
Name of the Technology	About the Technology	Major component/ dimensions	Performance Parameters	Advantages	Licensee
Commercial Grade Biodegradable Film for Water Packaging 	The film is biodegradable in nature, developed from biodegradable bio-composites, and produced in commercial scale meeting the requirements of water packaging. This eco-friendly is possible alternative to the single use plastic.	Developed using eco-friendly ingredients, including PLA, PHA, PBAT, PBS, and starch additives using the extrusion method	Mechanical strength, water resistance, thermal stability, biodegradability, and compatibility with liquid foods.	• Reduces environmental impact • Uses renewable resources like starch and bio-based polymers (PLA, PHA). • Alternative to traditional non-biodegradable plastics. • Sustainable packaging solutions	• Nature bioplastic PVT.Ltd., Hyderabad (TS)
Commercial Grade Biodegradable Film for Milk Packaging 	The film is biodegradable in nature, developed from biodegradable bio-composites, and produced in commercial scale meeting the requirements of water packaging. This eco-friendly is possible alternative to the single use plastic.	Developed using eco-friendly ingredients such as PLA, PHA, PBAT, PBS, starch additives, and Copper (Cu) and Silver (Ag)-based antimicrobial compounds using the extrusion method	Evaluate properties: including mechanical strength, water resistance, thermal stability, biodegradability, and compatibility with milk.	• Reduces environmental impact • Uses renewable resources like starch and bio-based polymers (PLA, PHA). • Alternative to traditional non-biodegradable plastics. • Sustainable packaging solutions	• Nature bioplastic PVT.Ltd., Hyderabad (TS)

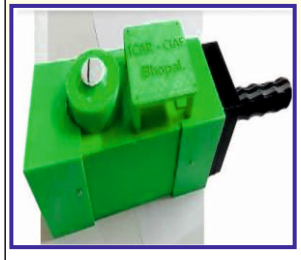
Name of the Technology	About the Technology	Major component/ dimensions	Performance Parameters	Advantages	Licensee
Technology for Production of Chemical Free Grape Raisins 	A package of technology with chemical free process for the production of grape raisins. The technology includes mechanically de-bunching the berries followed abrasive surface treatment and drying as per standard protocol, Raisins are prepared with no use of any chemicals in entire process with reduced drying time.	The package includes de-bunching machine and abrasive pre-treatment equipment and standardized drying protocol.	Power Source: Electric Motor (1.5 kW) Weight: 180 kg (2 machines) Capacity: 130-150 kg/h De-bunching Efficiency: 93-95% Abrasion Efficiency: 97% Cost: ₹1,50,000/-	• No use of chemicals in the process of raisin production • Reduction in drying time by 30-40% • Reduction in processing cost as compared to chemical process	• Vishwarup Agro Foods Pvt. Ltd. Sangli (MS)
Modular Backyard Poultry Cage 	It is a modular backyard poultry cage suitable for domestic use & small scale poultry business. It consist of rust free FRP material & modular in nature.	It consists of two tier (four cages) structure made of fibre reinforced plastic (FRP). It has provision of rest floor, dropping collection tray, roof and feeding trough.	• Capacity : 20-25 birds • Modular design	• Easy dismantling and assembling • Transportation cost will be reduced • Rust free and Easy cleaning • Light weight and rigid material • Suitable for domestic scale use	• Burgeon Agri Pvt. Ltd. Nasik (MS)

Name of the Technology	About the Technology	Major component/ dimensions	Performance Parameters	Advantages
Pilot scale MA Storage Structure for Fruits and Vegetables 	Developed modified atmosphere storage structure utilizing the principle of MA packaging. A polymeric film (LDPE+LLDPE 60µ) has been used as the lining material which act as a regulator for the transport of gases and water vapour. The structure is suitable for storage of guava, tomato and similar perishable produce.	Structure developed with perforated SS sheet, lining of a polymeric film of (LDPE+LLDPE 60µ) is provided at inner side of the structure.	Power Source: No Power Weight: 150 kg Capacity: 100 kg/batch Shelf life: (at ambient temp.); • Guava : 8 days • Tomato : 21 days Shelf Life : (at 10^{0}C.) • Guava : 20 days • Tomato : 35 days Cost : ₹ 25000/-	• Enhancement in shelf life of fresh fruits and vegetables. • Can be scaled up to required capacity. • Better retention of quality attributes. • Better monitory return to the user.
EAHE on-farm Storage Structure 	The earth air heat exchanger (EAHE) system integrated with the evaporative cooling attached to the storage structure. The reduction of temperature up to 22.6-25.5^{0}C. Only EAHE reduces temperature up to 25-27^{0}C and hence assisted for enhancing the cooling efficiency as well as cooling capacity of the ECS. Suitable for on- farm storage of fresh horticultural commodities.	The storage system includes the storage structure, evaporative cooling unit, piping and air blowing unit of EAHE.	Power Source: Electric Fans for Air blowing. Capacity : 1 tonne Temperature attained: 22.6- 25.5^{0}C Shelf life: Shelf life of tomatoes increased up to 21 Days (14 days at ambient temperature)	• Low cost on-farm storage system. • Less energy requirement. • Enhancement of shelf life of fresh horticultural produce. • Better retention of quality attributes.

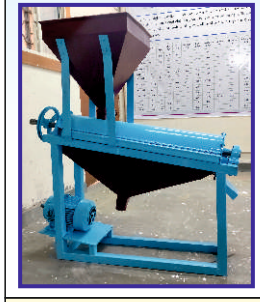
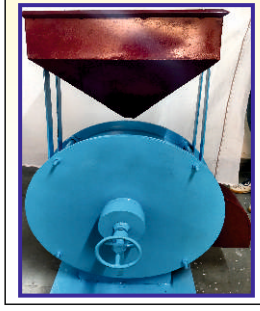
Name of the Technology	About the Technology	Major component/ dimensions	Performance Parameters	Advantages
Roof Top Natural Ventilator Based Modular Onion Storage System 	In this system, overhead fitted ventilator takes the air inside the stored onions and pushes it out via the outer flexible blades. The exited air removes the respiratory heat generated by the stored onions. This exist air process provide the ventilation to the stored lot which help reduction in storage losses. Suitable to store rabi harvest of the onion for 4 months.	Structure is made from lightweight, corrosion and UV resistive FRP material, natural air ventilator, overhang roof, cover.	Power Source: No Power Capacity : 1 tonne Reduction in storage losses: 35-40% over conventional practice. Cost: ₹ 20000/-	• Lower storage losses • Storage structure is rust proof & hence expected long life and durability. • Maximum retention of quality • Labour saving in handling operations
All Side Ventilated Onion Storage Structure 	This is the improved design of conventional natural ventilated system. The structure with 1 tonne capacity developed using wooden strips keeping in view of all side effective aeration to the stored lot.	Structure developed from wooden strips or bamboo strips.	Power Source: No Power Capacity:1 tonne Reduction in rotting losses: 58% over conventional practice (during 60 DOS). Cost: ₹ 15000/-	• Lower storage losses • Structure developed using locally available material. • Low cost. • Improved quality of the stored lot.

Name of the Technology	About the Technology	Major component/ dimensions	Performance Parameters	Advantages
Onion Descaler 	Removal of dry peel/ scale of onion is the common practice during storage and marketing of onions. Onion bulb descaler developed to reduce drudgery in manual operation and clean the onions effectively. Soft bristle rollers simultaneously removes the dry peel and conveyed bulbs towards down.	Consists of feed hopper, brush rollers with soft bristles, Collection chute and transport wheels.	Power Source: Electric Motor (0.75 kW) Weight: 70 kg Capacity: 1000 kg/h Descaling Efficiency: 88% Cost:₹ 35,000/-	• Replacement of laborious and tedious manual task. • Minimum damage to bulb. • The machine is easy for transportation. • Proper collection of dry peel. • Cost effective operation.
Package of Practices for Crop Residue Management in Field 	Developed for feed and fodder use of wheat/ paddy straw left after the combined harvesting. These straws gets collected and bailed using baling machine and converted into the densified blocks using feed block making machine and then treated with optimized ammonia gas in the developed treatment structure.	The technology package includes straw reaper, bailing machine, feed block making machine and ammonia treatment system	Straw Reaper: Effective field Capacity: 0.34 ha/h Chopped Straw Output: 1027 kg/h Length of Cut: 16 mm Bailing Machine: Power req: 3hp Compression Ratio: 3:1 Bale Density: 200 kg/m^3 Time per bale: 10-12 min Ammonia treatment: Capacity: 0.5 t No. of bales: 36	• Effective utilization of crop residue for feed and fodder. • Increase income to growers. • Increased storage life of bale. • Easy to transportation.

Name of the Technology	About the Technology	Major component/ dimensions	Performance Parameters	Advantages
Peeler for Medicinal Root Crops 	Peeling machine has been developed for medicinal root crops. Peeling in the machine takes place with abrasive drum surface and the central shaft mounted with array of nylon brushes. The brush assembly rotates against the abrasive surface hence carrying out peeling due to abrasion and shearing. The machine is most suitable for safed musali.	The principle components of machine are feed hopper, peeling drum, nylon brush assembly, water jet spray, and discharge chute.	Power Source: Electric Motor (0.75 kW) Weight: 150 kg Capacity:20 kg/h Peeling Efficiency: 92% (for safed musali in double pass) Cost: ₹ 1,00,000/-	• Drudgery reduction. • Mechanized peeling. • Reduce the drying time of the product. • Reduce the labour and time requirement.
Package For Processing Of Tender Jackfruit 	It is the package of machinery and process protocol for processing of tender stage jackfruit for minimal processing and production of powder. The technology includes peeling of whole tender jackfruit, make their cut pieces. The cut jackfruit with anti browning treatment can be used for vegetable purpose and it can be further shredded, dried and converted into powder. The powder has applications inbread/ bakery products.	The package includes the machines like tender jackfruit peeler, cutting machine, shredding machine, cold grinding machine and protocol for minimal processing and powder production.	Power Source: Electric Overall Capacity: 100-120 kg/h Peeling Efficiency: 90-95% Approx. Cost: ₹ 5,00,000/-	• Drudgery reduction in multiple operation. • Effective utilization of tender jackfruit. • Labour saving. • Time saving.

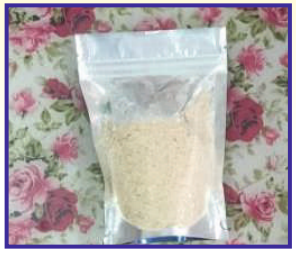
Name of the Technology	About the Technology	Major component/ dimensions	Performance Parameters	Advantages
Device for Rapid Detection of Aflatoxin-B1 in Maize 	The hand-held device comprising a multi- spectral sensor is used for Hyperspectral imaging (HSI) based identification of aflatoxin-B1 on maize grain in the form of low (<30 ppb), medium (<100 ppb) and high (>100 ppb).	The instrument consists of multi-spectral sensor, abuilt-in aperture, 16- bit ADC, LEDs, micro- controller, power bank and TFT touch display.	Power Source: Electric Power Bank (5V~2A, 5000 mAh) Detection Range: Low (<30 ppb), Medium (<100 ppb) High (>100 ppb) Accuracy: 80 %	• Rapid detection of aflatoxin B-1 in maize. • Non-destructive method.
Gluten Extractor 	The machined used for the production of fresh gluten, gluten flour and gluten free flour. The machine operated with the standardized process for particular fraction of the gluten.	The main components of the machine includes Twin screw kneading cum mixing system, holding tank, speed controller and discharge valve.	Power Source: Electric Motor Capacity: 100kg/h Screw rpm: 50 rpm Fresh Gluten: 27% Cost: ₹ 1,00,000/-Appx.	• Single machine gives four output products. • Suitable for pilot scale application. • Lower effluent loss. • Enhanced capacity.
Pilot Plant for Minimal Processing of Cut Vegetables 	This is a pilot plant of various machinery suitable for producing minimally processed cut vegetables like carrot slices/ shreds/ cubes/ grates, cauliflower florets, cabbage shreds etc.	The pilot plant consists of Washing cum treatment tank, Multipurpose vegetable cutter, cauliflower floret cutter, ozone treatment system, centrifugal dryer, packaging unit and UV treatment chamber.	Power Source: Electric (Total 2.625 kW for different machines) Capacity:100 kg/h Sanitizing Agent: Ozone and UV-C radiation. Cost: ₹ 5,50,000/-	• Chemical or heat free sanitization of cut vegetables. • Ready to Use/ Ready to Cook Product • Can store up to 9-12 days under refrigerated conditions

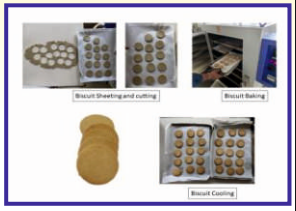
Name of the Technology	About the Technology	Major component/ dimensions	Performance Parameters	Advantages
Grain Handling, Treatment And Bagging Machine 	This is an integrated self-propelled machine perform the multiple operations like collection, conveying, surface treatment and bagging of the food grains spreaded over yard or in the form of heap. Suitable for all types of food grains.	The major working components includes screw conveyor, inclined bucket elevator, hopper, conveying deck, IR heater array and bag holder.	Power Source: Electric (3.2kW) Weight: 200 kg Capacity: 0.6 t/h Insect mortality: 100% Forward speed: 0.7 km/h Approx. Cost: ₹ 1,00,000/- Appx.	• Drudgery reduction in multiple operation. • Chemical free disinfestation. • Labour saving. • Time saving.
Smart Packaging System 	A naturally extracted dye infused paper strip based intelligent indicator was developed for packaging of fresh agro commodities. The indicator shows visible colour change with respect to change in pH and VOC's of the commodities change/ generated during spoilage.	The principle component of the system includes natural dye, paper strip (filter paper of cellulose based), and packaging material.	Mushroom: on 0^{th} day color was lavender (fresh), on 12^{th} day colour changed to dusty blue (spoiled). Sapota: On 0^{th} day colour was light yellow (fresh) and changed to light pink on 16^{th} day (spoiled)	• Non-destructive and cost-effective assessment of freshness. • Use of natural dye. • No use of any synthetic chemical.

Name of the Technology	About the Technology	Major component/ dimensions	Performance Parameters	Advantages
Millet Dehusker 	The machine is suitable for de-husking of variety of millets like kodo, kutki etc. It works on the principle of shearing and crushing. Pair of rollers is the key component of the machine.	Pair of rubber rollers rotating at differential speeds in opposite direction. Feeding hopper, Cyclone separator, Power transmission mechanism	• Capacity: 50 kg/h • De-husking Efficiency: 70-75 % • Brokens : 3-5%	• Suitable for multiple millets. • Minimum damage due to the use of rubber rollers for dehusking.
Millet Polisher 	Machine is suitable polishing of different types of millets. It works on the principle of shearing and abrasion for removal of outer layer	The important working components of the machine includes emery roller, perforated casing and feeding hopper	• Capacity: 50 kg/h • Polishing Efficiency: 70-80 %	• Suitable for multiple millets. • Minimal damage during polishing
Flour Mill 	The machine consists of pair of emery disc between which the millet is crushed to obtain the flour.	Consisting the main pair of emery coated disc, casing, feeding hopper, discharge chute	• Capacity: 50 kg/h • Milling Efficiency: 90-95 %	• Uniform milling • Suitable for Multi Millets

INNOVATIVE VALUE ADDED FOOD PRODUCTS

AGRO PRODUCE PROCESSING DIVISION,
ICAR-CENTRAL INSTITUTE OF AGRICULTURAL ENGINEERING

Name of the Technology	About the Technology	Major Ingredients	Nutritional Composition (g/100 g)	Advantages	Licensee
RTS Millet Lassi 	Fermented drink refreshing, nutritious, and gluten-free beverage that supports overall health.	Fermented sorghum, coconut milk, and starter culture.	Per 100ml contains Protein : 2.3 g Carbohydrates : 60 g Fat : 0.8 g Calcium : 10 mg Magnesium:14mg	• Suitable for individuals with gluten intolerance • Fermented product, promoting gut health • Rich in Essential Minerals • Low Glycemic Index drink • Particularly hydrating and refreshing beverages.	• Srajan Infratech, Narela Shankari, Bhopal (MP) • Dhanwantari Agro Krushak Producer Company Limited, Sohagpur, Shahdol (MP)
Millet Based Nutrient Dense Nutri-Spread 	Nutrient dense product	Fermented millets, green gram, peanut, soymilk powder, edible oil, sugar, salt, and cocoa powder.	Protein : 12-13g Carbohydrates : 50-52g Fat : 25-27g Iron : 40mg Phosphorus : 25 mg	• Nutrient-Rich Formula • High Protein Content • Low Glycemic Index • Rich in Micronutrients • Natural Sweetening: Cocoa powder and minimal sugar content provide flavour without excessive calories.	• Srajan Infratech, Narela Shankari, Bhopal (MP) • Dhanwantari Agro Krushak Producer Company Limited, Sohagpur, Shahdol (MP)
RTC Millet Instant Dalia 	Ready-to-Cook (RTC) Instant Dalia.	Fermented millet, harnessing the benefits of fermentation.	Protein : 10.3 g Fat : 1.89 g Carbohydrates : 62 g Ash : 1.34 g Magnesium : 140 mg	• Rich in protein, carbohydrates, and essential minerals. • Enhanced Digestibility • Aligns with health trends favouring low- fat food options. • Convenient and Ready-to-Cook	• Srajan Infratech, Narela Shankari, Bhopal (MP) • Dhanwantari Agro Krushak Producer Company Limited, Sohagpur, Shahdol (MP)

Name of the Technology	About the Technology	Major Ingredients	Nutritional Composition (g/100 g)	Advantages	Licensee
Millet Based Biscuit 	Millet jaggery-based biscuit	Whole wheat flour, pearl millet, foxtail millet, and jaggery for natural sweetness. and delicious snack option.	Protein : 10.2 g Fat : 20.56 g Carbohydrates : 64 g Ash : 1.65 g	• Rich in fiber, protein, and essential minerals with natural sweetener have lower glycemic index • Reduce blood sugar spikes, suitable for those looking to control blood sugar levels.	• Srajan Infratech, Narela Shankari, Bhopal (MP) • Dhanwantari Agro Krushak Producer Company Limited, Sohagpur, Shahdol (MP)
RTE Millet Based Laddu 	Nutrient-dense superfood	Millets, soybeans, peanuts and sesame.	Protein : 10.71g Fat : 29.5g Carbohydrates : 52.81g Iron : 6.5 mg Calcium : 140 mg	• Delicious and healthy snack option. • Balanced nutritious profile • Rich in essential nutrients, including protein, dietary fiber, iron, and calcium, making it healthy • Fiber content from millets and sesame supports better digestion and gut health.	• Srajan Infratech, Narela Shankari, Bhopal (MP) • Dhanwantari Agro Krushak Producer Company Limited, Sohagpur, Shahdol (MP)
Chemical free Raisins 	It is a product made with a chemical free process. The process includes de- bunching of grapes, removal of waxy layer with abrasive pre-drying treatment and drying under controlled condition.	Grapes especially grown for raisin production	Calories: 335 Kcal Carbohydrate: 80 g Total fat : 0.45 g Protein : 3.5 g Total Anthocyanin: 0.88 mg Phenol content: 19.7 mg	• No use of any chemicals in entire process of raisin making.	• Vishwarup Agro Foods Pvt Ltd. Sangli (MS)

Name of the Technology	About the Technology	Major Ingredients	Nutritional Composition (g/100 g)	Advantages	Licensee
Soy Milk Powder 	Soy beverage powder is a nutritious food choice, known for its health benefits	Soybeans, which are the primary ingredient, water, natural sweeteners, flavourings agent and stabilizers.	Protein : 37 g Fat : 20 g Carbohydrate : 32 g	• Suitable for lactose intolerant or avoiding dairy products. • Can be used in various recipes, including smoothies, baking, and cooking. • Contains isoflavones, which have antioxidant properties. • Cholesterol-free and rich in unsaturated fats	• Bio-nutrients Ltd. Mandideep (MP)
Extruded functional Snack Foods 	Grain-Based Protein Rich Extruded Snack Foods	Corn, rice, defatted soy flour	Energy : 337 kcal Protein : 20.5 g Fat : 1.34 g Carbohydrates : 55.13 g	• The production process enhances texture, flavor, and digestibility, making the snacks more appealing. • With only 1.34% fat, they are a healthier alternative to traditional high-fat snacks. • High protein and fiber content can promote satiety, helping to manage hunger and support weight management.	Agro Soymilk Organic Plant, Gambowal, Dist. Hoshiarpur, (Punjab)

Name of the Technology	About the Technology	Major Ingredients	Nutritional Composition (g/100 g)	Advantages	Licensee
Soy Chaap 	Soy Chaap is rich in protein and provides a meat-like texture	Soy flour, wheat gluten, edible oil and salt.	Water Activity : 0.54 pH : 6.48 Microbial Load : 0.03 log CFU/g Overall Sensory Score : 8.02 Shelf Life : 100 days.	• Excellent option for vegetarians and vegans seeking to meet their protein needs • High protein content helps to manage hunger and overall calorie intake. • Soy chaap contains essential vitamins and minerals, for bone health and overall well-being.	• Perfect Business Solutions, Annapurna Road, Indore (MP) • Vezlay Foods Pvt Ltd. Patparganj (Delhi) • Madhav Enterprises, Ayodhya Bypass, Bhopal (MP) • Soyaagri Enterprises, MIDC, Pawane, Thane (MS) • Mohite Agro Farm, Kolhapur (MS) • Khiyansh Dairy Delight, Gurugram (HR)
Soy fortified Nutritious Healthy Noodles 	Nutritious product	Wheat flour, refined wheat flour, defatted soy flour, vegetable powder	Energy Value : 309.78 kcal Hardness : 143 g Fat : 0.972 g Moisture :4.35%	• Provide balanced nutritional profile. • Defatted soy flour enhances protein levels, supporting muscle health. • Vegetable powder, adding vitamins and minerals for overall health.	• Agro Soymilk Organic Plant, Gambowal, Dist. Hoshiarpur, (Punjab)

Name of the Technology	About the Technology	Major Ingredients	Nutritional Composition (g/100 g)	Advantages
CIAE Kodo Halwa Mix 	Kodo Halwa Mix is a nutritious, gluten-free mix	Kodo rice, powdered sugar, dry fruits, skim milk powder and fats.	Moisture: 1.6 % Protein: 8.8 g Fat : 10.6 g Carbohydrates: 77.6 % Ash, and Trace Amounts of Vitamins : 12 %	• Suitable for those with gluten intolerance • Aids digestion and helps regulate blood sugar levels. • Provides essential fatty acids • Offers vitamins, minerals and antioxidants
CIAE Kodo Kheer Mix 	CIAE Kodo Kheer Mix is highly nutritious ready to cook mix developed by a novel fermentation technology	Kodo rice, cardamom, dry fruits, skim milk powder and fats.	Moisture : 2.6 % Protein : 10 g Fat : 2.8 g Carbohydrates : 82.7 g Ash : 6.8 %	• Supports muscle growth, repair, and overall health. • Ideal for weight management and cardiac health • Gluten-Free • Mineral-Rich
Masala Sorghum 	Gluten free healthy breakfast cereal replaces meal with all goodness of millets and vegetables.	Fermented sorghum grain, roasted defatted soybean flour, dry vegetable, sugar, spices, skim milk powder and salts.	Moisture : 6 % Protein : 10 g Fat : 1 g Carbohydrates : 78.5 g Ash : 5.5 %	• Diabetic and cardiovascular friendly product. • Gluten-free • Rich in minerals and vitamins • No artificial flavours or added preservatives • Adequate shelf life (3 months)

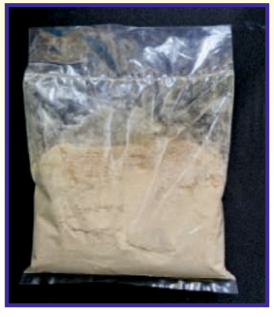
Name of the Technology	About the Technology	Major Ingredients	Nutritional Composition (g/100 g)	Advantages
Onion Paste 	The onion paste is developed using a standardized unit operations like peeling, cutting, blanching, wet grinding, concentration, preservative addition, packaging and retorting. The prepared paste can be used as ingredient for various food applications.	Major ingredients of the paste include mature healthy onion bulbs, salt, sodium benzoate, citric acid.	Moisture: 80-82% pH: 3.93 Carbohydrate: 1.9 g Titrable acidity: 0.07/100 g Processing Cost: Rs. 2.50/kg	• Better utilization of onions during glut • More benefit to the growers. • Potential enterprise for onion growing belt • Shelf life up to 3 months.
Minimally Processed Tender Jackfruit 	The product is obtained by peeling and cutting of tender stage jackfruit. Peeled jackfruit is cut into customized pieces. A treatment of ascorbic acid (1.5 % for 10 min) and ozone (1 ppm for 10 min) is provided to avoid the enzymatic browning and extend the shelf life of the processed product.	Tender stage jackfruit	Ascorbic acid: 15.30 mg Total phenolic content: 20.26 mg TSS: 7.2^{0}Brix	• No use of synthetic chemicals • Processed with green techniques like ozone and ascorbic acid treatment
Fermented Sorghum Flour 	Gluten-free cereal flour is perfect for preparing various dishes like chapatti, offering a nutritious alternative to traditional flours.	Fermented sorghum, using novel fermentation technology.	Moisture : 7.3% Protein : 9.2 g Fat : 3.12 g Carbohydrates : 76.165 g Ash : 1.65%	• Diabetic and cardiovascular friendly product. • Gluten free • Rich in minerals and vitamins

Name of the Technology	About the Technology	Major Ingredients	Nutritional Composition (g/100 g)	Advantages
Sorghum Upma Mix 	Highly nutritious ready to cook mix.	Fermented sorghum grain, chickpea flour, tamarind powder, condiments, spices and additional fats.	Moisture : 2.6 g Protein : 10 g Fat : 2.8 g Carbohydrates: 76.1 g Ash : 6.8 g	• Ideal for individuals with gluten intolerance • Dietary fiber, supporting digestive health and regulating blood sugar levels. • Helps maintain steady energy levels • Adequate shelf life (more than 3 months)
Tofu Whey Based Papaya Beverage 	It is a Ready to Drink beverage.	Fermented tofu whey, papaya pulp, starter culture, sugar, and natural food additives.	Protein : 2.84 g Total Sugar : 7.898 g Calcium : 25.41 mg Iron : 1.65 mg	• Unique nutritional and functional properties • Lactose free beverage • Increase mineral absorption • Improved sensory characteristics • Products have good quality at low production cost
Complimentary RTE Protein Rich Energy Dense Comfo Spread 	Comfo Spread is a ready-to-eat, highly nutritious product with high viscosity	Processed peanuts, composite flour mixture, skim milk powder, vegetable oil, moringa leaf powder, salt, sugar, and fortified with natural vitamins and minerals.	Protein : 34.6 g Fat : 23.5 g Carbohydrates : 36.5 g Calcium : 152 mg Magnesium : 130 mg	• Supports growth, repair, and overall health • Ideal for recovery from malnutrition. • Nutrient and energy dense product • Boost the nutritional density of diets of young children • Consumed as a snack or mixed with food Adequate shelf life (>4 months)

Name of the Technology	About the Technology	Major Ingredients	Nutritional Composition (g/100 g)	Advantages
Fruit Puree (Banana Strained Food) 	A ready to eat fruit puree (strained food) is complementary food supplement suitable for weaning.	Processed banana and sweetener	Protein : 1.49 g Carbohydrates : 12.12 g Fiber : 1.3 g Vitamin C : 4.5 mg Calcium : 1.49 mg Magnesium : 19.83 mg	• Can be introduced as first baby food • Fairly uniform with High mineral content • Rich in Vit. C, Calcium, Magnesium and Iron.
Fruit Puree (Papaya Strained Food) 	A ready to eat fruit puree (papaya strained food) is complementary food supplement suitable for weaning.	Processed papaya and sweetener	Protein : 1.0 g Carbohydrates : 7.06 g Fiber : 1.0 g Vitamin C : 4.5 mg Calcium : 12.16 mg Magnesium : 9.2 mg	• Introduced as first baby food • Rich in Vit. C, Calcium, Iron and fibre. • The price of formulated baby foods is suitable for the low income groups
Probiotic Soy Cheese Spread 	Probiotic soy cheese spread is soy product with characteristics of probiotics	Fermented soymilk, edible oil, prebiotics, probiotic cultures, salt, and sugar.	Protein : 17.60 g Fat : 25.32 g Total Soluble Sugar :19.8 g Ash : 1.72g	• Improve intestinal microbial balance • Combats diarrhea • Modulate the immune system • Enhance nutrient value • Increase organoleptic properties

Name of the Technology	About the Technology	Major Ingredients	Nutritional Composition (g/100 g)	Advantages
Moringa-Beetroot based Complementary Health Beverage 	Beverage can help in reducing the malnutrition, and it can also be consumed as a refreshing health drink with added benefits of prebiotic and antioxidants attributes.	Moringa leaf, antioxidants, herbs, stabilizers, beetroot, pineapple, and natural vitamins and minerals.	Protein : 4.37 g Calcium : 2.69 mg Iron : 1.61 mg Magnesium : 7.08 mg	• Nutrient rich food option for micro nutrient deficiencies. • Lactose free with high bioactive compounds • Rich source of soluble and insoluble dietary fiber like pectin • Excellent source of antioxidant vitamin-C.
Protein Rich Soya Based Composite Flour Mixture 	A protein rich composite flour mixture	Defatted soy flour, wheat or rice, green gram, moringa leaf powder, skim milk powder, and fortified with natural vitamins and minerals.	Protein : 18.80 g Fat : 6.43 g Carbohydrates : 62.67 g Protein Digestibility : 82% Calcium : 2.69 mg	• Made from locally grown and available ingredients with suitable processing • Suitable in-vitro protein digestibility (79% to 81%) • Adequate shelf life (3 months) • Protein contents of composite flour formula provides for recommended daily intakes
Soy-Banana Based Sprinkles 	Sprinkles are ready to eat fortified complementary food supplement to combat malnutrition.	Soy curd, moringa leaf powder, composite flour mixture, banana, and fortified with natural vitamins and minerals.	Protein 23 g Fat : 16 g Carbohydrates : 62.67 g Calcium : 175 mg Magnesium : 174 mg	• Good amount of protein, supporting growth and development. • Provides energy and adds volume to the diet • Supports gut health by improving digestion and enhancing the immune system.

Name of the Technology	About the Technology	Major Ingredients	Nutritional Composition (g/100 g)	Advantages
Soy-Papaya Based Sprinkles 	Sprinkles are ready to eat fortified complementary food supplement to combat malnutrition.	Soy curd, moringa leaf powder, composite flour mixture, papaya, and fortified with natural vitamins and minerals.	Protein : 27.0 g Fat : 15 g Carbohydrates : 42 g Calcium : 60 mg Magnesium : 141 mg	• Energy and nutrient dense • Sachets are light weight and are simple to store, transport and distribute • Consumed as a snack or mixed with food • Designed with protein, vitamin, mineral and antioxidant -rich supplements
RTE Millet based Health Mixture 	Millet-based mixes address issues with better nutrition, sustainability, and inclusivity.	Millet grains, pulses (such as green gram, chickpeas, and peas), nuts and seeds, dried fruits, cocoa powder/ vanilla powder, and soy milk powder.	Protein : 18.5 g Carbohydrates : 60 g Fat : 14 g Calcium : 149 mg Iron : 5.0 mg	• Nutrient-Rich • Balanced Amino Acid Profile • Improve protein digestibility and nutrient absorption. • Suitable for individuals with gluten intolerance. • Low Glycemic Index and suitable for diabetic individuals. • High Consumer Acceptability • Free from Preservatives
RTS Millet Based Beverages 	Innovative beverage made from fermentation process	Fermented sorghum, coconut milk, and soy milk powder.	Proteins : 2.5 g/100 ml Carbohydrates : 9 g/100 ml Fats : 0.9 g/100 ml	• Nutritious and functional drink options • Coconut milk provides healthier alternative to sugary beverages • Suitable for individuals with lactose intolerance • Nutrient-Dense Composition. • Low Glycemic Index drink

Name of the Technology	About the Technology	Major Ingredients	Nutritional Composition (g/100 g)	Advantages
Tender Jackfruit Powder 	The product is obtained with peeling, cutting, shredding, drying and cold grinding of tender jackfruit. Drying was carried out in convective tray dryer at 50^{0}C temperature. The dried shreds were subjected to cold grinding (10-12^{0}C temperature) for retention of nutritional parameters of the powder.	Tender stage jackfruit	Moisture : 8.77 % (db) Ascorbic acid: 6.084 mg Phenolic Content : 15.36 mg	• No use of synthetic chemicals • Processed with green techniques like ozone and ascorbic acid treatment • Can be incorporated in products like bread/roti and bakery products.
Tomato Puree 	The series of operations like washing, blanching, peeling, pulping, grinding/crushing, sieving, cooking, bottling and cooling are performed for preparation of tomato puree. The concentration of the product is judged on the basis of Brix.	Ripened healthy red tomatoes, natural preservatives.	Protein: 1.4 g Carbohydrate: 15.6 g Dietary Fiber: 1.4 g TSS: 8.3^0 Brix Acidity: 1.1 pH: 3.8 Viscosity : 0.23 Pa.S	• Used natural preservatives. • No added chemicals. • Effective approach to handle glut in market. • Improved shelf life. • Potential enterprise at production catchment.

Name of the Technology	About the Technology	Major Ingredients	Nutritional Composition (g/100 g)	Advantages
Tomato Ketchup 	The series of operations like washing, blanching, peeling, pulping, grinding/ crushing, sieving, cooking, preservatives and spice ingredients addition, final cooking, bottling and cooling are performed for preparation of tomato puree.	Ripened healthy red tomatoes, dried spices, natural preservatives.	Protein: 0.9 g Carbohydrate: 28.6 g Dietary Fiber: 0.4 g TSS: 38^{0}Brix Acidity: 1.6 pH: 3.3 Viscosity : 4.08 Pa.S	• Used natural preservatives. • No added chemicals. • Effective approach to handle glut in market. • Improved shelf life. • Potential enterprise at production catchment.
Tomato Powder 	The process for development of tomato powder includes washing and cleaning of tomatoes, slicing, drying, grinding, sieving and packaging. The powder may be used as ingredient for various food product applications.	Ripened healthy red tomatoes, cutter and slicer, dryer	Energy: 302 Kcal Protein: 10.2 g Fat: 0.44 g Carbohydrates: 74 g Dietary Fiber: 12 g Sugars: 47 g	• Used natural preservatives. • No added chemicals. • Effective approach to handle glut in market. • Improved shelf life. • Potential enterprise at production catchment.
Fermented Pearl Millet Flour 	Gluten-free flour, with reduced tannins, offers improved taste and shelf life, ideal for making chapatti and other dishes.	Fermented pearl millet developed using novel fermentation technology.	Moisture : 7.21% Protein : 7.9 g Fat : 3.2 g Carbohydrates : 76.8 g Ash : 1.4%	• Diabetic and cardiovascular friendly product. • Gluten free • Rich in minerals and vitamins • No artificial flavouring or added • preservatives

Name of the Technology	About the Technology	Major Ingredients	Nutritional Composition (g/100 g)	Advantages
Gluten Powder 	It is prepared from the wheat flour through the series of unit operation like soaking, kneading, mixing, dough formation, washing etc. at standardized process conditions.	Wheat flour and gluten extractor	Protein : 69 g Carbohydrate: 13.8g Moisture : 2.1 g Dietary Fiber : 0.6 g Ash: 1 g Fat: 1.85 g	• The powder can be used for soy chaap, baking products, • meat products, pasta and noodles. • Obtained gluten free flour as additional product.
Soya Milk 	Soya milk is prepared through the sequential unit operation with soybean like cleaning, dehulling, soaking, cooking, grinding and filtration.	Cleaned soybean grains, water, soya milk plant	Energy : 54 kcal Fat : 1.6 g Carbohydrate : 6 g Dietary Fiber : 0.4 g Protein: 3.3 g	• Vale addition in soybean • Rich source of protein • Maintain the cholesterol level • Improve bone health Improves heart health
Tofu 	It is also known as soya paneer as prepared from soya milk. The filtered soya milk is acidified using citric acid followed by filtration and pressing.	Cleaned soybean grains, water, soya milk and pressing device	Protein: 14 g Energy: 102 kcal Fat: 9.0 g Carbohydrate: 2.2 g Dietary Fiber: 0.3 g	• Value addition in soybean • Rich source of protein • Maintain the cholesterol level • Improve bone health • Improves heart health

Name of the Technology	About the Technology	Major Ingredients	Nutritional Composition (g/100 g)	Advantages
Onion Powder 	The process for development of onion powder includes sorting, descaling, washing and peeling of onions. Peeled onions then sliced, dried, and grinded in to powder. The powder may be used as ingredient for various food product applications.	Matured, cured and healthy red onions, cutter/ slicer and dryer	Energy: 302 Kcal Protein: 10.2 g Fat: 0.44 g Carbohydrates: 74 g Dietary Fiber: 12 g Sugars: 47 g	• Effective approach to handle glut in market. • Improved shelf life. • Potential enterprise at production catchment.
Fermented Tofu Whey and Ripe Tomato Based Coagulant Mixture 	Coagulant mixture for tofu preparation.	Soybean, tofu whey, tomato, salt and starter culture	Protein : 13-15 g Fat : 6- 8 g Ash : 9-11 g	• Reduces waste generation and environmental pollution. • Enhanced Product Development • Innovative Coagulation method for nutrient fortification • The use of a natural, plant-based coagulant results in a healthier and cleaner tofu production process.

Contact:
Head, Agro Produce Processing Division,
ICAR-Central Institute of Agricultural Engineering, Nabi bagh, Berasia Road, Bhopal-462038
Email: sukhdev0108@gmail.com I Contact No.: 07477269857