




## 6. LIVESTOCK PROCESS


Pet Food from slaughter house waste/ by-products																															
<b>i</b>	<b>Name of the technology</b>	:	Pet Food																												
<b>ii</b>	<b>Application/ Use</b>	:	Cost wise offal/waste of slaughterhouses is cheaper as compared to lean meat. Pets particularly dogs have habits of biting and chewing house hold articles such as shoes, toy sticks. Products based on slaughter house meat by products viz hide, skins & their trimming, head shanks and tails hides, and bones etc.) could be developed for this purpose.																												
<b>iii</b>	<b>Description of Technology :</b>	<p>Presently M/S Nestle, Purina Pet Care, Hyderabad, M/S Al-pets (Allana &amp; Sons), Unnao and M/S J.S. International, Unnao are engaged in production of pet food/dog chew. The purpose of this investigation is to develop cheaper pet food at micro/small level to develop this fast emerging sector in India. This technology has been developed for manufacturing of pet food by using selected meat offals mixed in 40 to 50% ratio by weight, residues of potatoes and cereals.</p>																													
<b>iv</b>	<b>Input Required:</b>																														
<b>v</b>	<b>a) Raw material</b>	:	<table border="1"> <thead> <tr> <th>Ingredient</th> <th>40% offal incorporation</th> <th>50% offal incorporation</th> </tr> </thead> <tbody> <tr> <td>Offal (meat trims)</td> <td>40</td> <td>50</td> </tr> <tr> <td>Wheat flour</td> <td>40</td> <td>30</td> </tr> <tr> <td>Potato</td> <td>15</td> <td>15</td> </tr> <tr> <td>Milk powder</td> <td>2.5</td> <td>2.5</td> </tr> <tr> <td>Baking powder</td> <td>0.6</td> <td>0.6</td> </tr> <tr> <td>SHMP</td> <td>0.3</td> <td>0.3</td> </tr> <tr> <td>Salt</td> <td>0.6</td> <td>0.6</td> </tr> <tr> <td>Vegetable fat</td> <td>1.0</td> <td>1.0</td> </tr> </tbody> </table>	Ingredient	40% offal incorporation	50% offal incorporation	Offal (meat trims)	40	50	Wheat flour	40	30	Potato	15	15	Milk powder	2.5	2.5	Baking powder	0.6	0.6	SHMP	0.3	0.3	Salt	0.6	0.6	Vegetable fat	1.0	1.0	
Ingredient	40% offal incorporation	50% offal incorporation																													
Offal (meat trims)	40	50																													
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Vegetable fat	1.0	1.0																													
	<b>b) Plant and machinery</b>	:	(i) Low cost pet food making machine with motor (capacity 10 kg/hr) : Rs. 50,000/- (ii) Heat sealing machine : Rs. 35,000/- (iii) Tray dryer : Rs. 65,000/-																												
	a) Overall dimension	:	Length 51"X width 10"Xheight 31"																												
	b) Weight	:	60 kg																												
	c) Power	:	01 HP																												
	d) Man power	:	1 Skilled and one unskilled labour																												
	e) Land	:	30'X20' shed with pucca flooring																												
	f) Investment	:	2,00,000/-																												
<b>vi</b>	<b>Output capacity</b>	:	80 kg/day (8 hrs basis)																												
<b>vii</b>	<b>Unit cost</b>	:	Rs. 50/kg																												
<b>viii</b>	<b>Contact address</b>	:	PI, AICRP on PHT Department of Post Harvest Engineering and Technology Aligarh Muslim University, Aligarh- 202002 (UP)																												




<b>i.</b>	<b>Name of the technology developed</b>	: Pet Food Preparation
<b>ii.</b>	<b>Application/ Use</b>	: Pet feed from slaughter house waste/ by-products
<b>iii.</b>	<b>Description of Technology :</b> <p>This centre has also developed pet food by utilizing only slaughter house offals, without any pulses, fruits, vegetable and cereal residue to further reduce the cost of production and also to increase the nutritional value of pet food.</p> <p>Offals (Heart, tongue, head meat and udders), guar gum, sugar, salt, vegetable oil and sodium nitrate are the major raw materials used for the pet food production. The meat is washed, cooked, minced, and added the other ingredients and mixed properly. The dough is fed in a mincer attached with a biscuit die for the production of pet biscuit. Biscuit will be dried in an oven/dryer. Initially the temperature of oven was kept at 80°C for two hr &amp; 100°C for 30 minutes and for rest of the eight hrs 50°C maintained.</p>	
<b>iv.</b>	<b>Input required</b>	:
<b>v.</b>	<b>a) Raw Material</b>	: Offals, Salt, Sugar, Guar gum, Vegetable oil, potassium sorbate as preservative
<b>vi.</b>	a) Plant and machinery	: (i) Meat mincer attached with a biscuit die (capacity 10 kg/hr) : Rs. 50,000/- (ii) Heat sealing machine : Rs. 35,000/- (iii) Tray dryer : Rs. 65,000/-
	b) Overall dimension	: Length 395mmX width 360 mm X height 485mm
	c) Weight	: 18 kg
	d) Power	: 1.1kw / 1.5hp
	e) Man power	: 1 Skilled and one unskilled labour
	f) Land	: 30'X20' shed with pucca flooring
	f) Investment	: 2,00,000/-
<b>vii</b>	<b>Output capacity</b>	: 80 kg/day (8 hrs basis)
<b>viii</b>	<b>Unit cost</b>	: Rs. 50/kg
<b>ix</b>	Contact address	: PI, AICRP on PHT Department of Post Harvest Engineering and Technology Aligarh Muslim University, Aligarh- 202002 (UP)

<b>i</b>	<b>Name of the technology</b>	: Soya protein isolate in buffalo sausage preparation
<b>ii.</b>	<b>Application/Use</b>	: For human consumption
<b>iii.</b>	<p><b>Description of technology:</b> Buffalo meat emulsion sausage was developed by incorporation of soya protein isolate to increase the protein content. Meat and fat was chopped to a very fine particles form in bowl cutter. 20% ice was added to reduce the temperature during chopping. Spices and condiments were added after 5 minutes of mixing. Finally soya protein isolate was added in different proportion to get smooth emulsion. The emulsion was transferred to stuffing machine and sausages were stuffed in cellulosic casing and finally cooked in sausage cooker (steam cooking at 110°C for 15 minutes).</p>	
<b>iv.</b>	<b>Input</b>	:
	a) Raw material	: Lean meat, animal fat, soya protein isolate, spice mixer, condiments (garlic, ginger, and onion paste), salt etc.
	b) Plant and machinery	: i. Bowl chopper (Cost: Rs. 2.5 lakhs; Dimension: 63 cm x 52cm x 61cm; Weight: 25 kg). ii. Stuffing machine (Cost: Rs. 60,000; Dimension: 56 cm x 34cm x 27 cm; Weight: 7 kg). iii. Sausage cooker (Cost: Rs. 55,000; Dimension: 76 cm x 41 cm x 52 cm; Weight: 20 kg).
	c) Man power required	: One skilled labor
	d) Land required	: 12"x15"
	e) Investment	: Approx. 4.0 lakhs
<b>v.</b>	Output capacity	: 80 kg/day (8 hr basis)
<b>vi.</b>	Unit cost	: Rs. 150 per kg
<b>vii</b>	Addresses of contact person	: PI, AICRP on PHT Department of Post Harvest Engineering and Technology, Aligarh Muslim University, Aligarh – 202002 (UP)

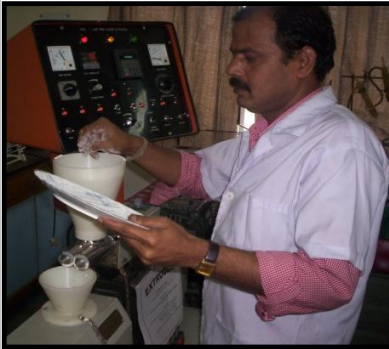

i.	<b>Name of the Technology</b>	:	Honey treated deep fried chicken nuggets
ii.	<b>Application/ Use</b>	:	Meat Processing
iii.	<b>Description of Technology :</b>		
			<p>Spent chicken was dressed as per standard procedure and hot deboning process was followed to separate the lean and fat. The lean and separable fat were stored at (-) 20°C and (-) 26°C, respectively until use. The lean was cut into small pieces of weighing approximately 30-50g. The lean pieces of chicken were then packed tightly in polyethylene bags and stored in a deep freeze maintained at -20°C. The separable chicken fat was also cut into smaller pieces of about 20-30g and after packing these were stored at (-) 26°C. The lean of spent chicken stored at -20°C were first thawed for overnight and then vacuum tumbled for 3-4 hours. The chicken fat was, however, not thawed and introduced in to the bowl chopper in frozen state. The tumbled lean and frozen fat were mixed according to different formulation and bowl chopped for 1min at slow speed followed by 2min at high speed. Spices and curing ingredients were directly added as per the recipe to the chopped meat in the bowl chopper.</p> <p>The sausage emulsions thus prepared were kept overnight in the refrigerator maintained at 10-12°C. Finely crushed ice crystals @ about 1% of the sausage mix were added during bowl chopping. The chicken emulsions were then filled into moulds and cooked in a preset time temperature combination in a cooking vat. Immediately after cooking, the meats with the mould were immersed in ice-cold water. The cooked meat were then cut into desired shape and soaked in honey syrup for overnight. Following soaking, the meat cubes were washed in running tape water and allowed to dry. Chicken nuggets thus prepared were deep fried in cooking medium and on cooling packaged in a polyethylene bag.</p>
			
iv.	<b>Input/raw material</b>	:	Chicken and honey
v.	<b>Output capacity</b>	:	Not defined
vi.	<b>Unit cost (per machine)</b>		Not defined
vii.	<b>Suitability for crop/ commodity</b>		-
viii.	<b>Efficiency</b>		-
ix.	<b>Unit cost of operation</b>		-
x.	<b>Patent obtained/applied</b>	:	No
xi.	<b>Commercialization status</b>	:	Nil
	a) No. of Licensees	:	Nil
	b) Addresses of Licensees or Manufacturer	:	Not available
xii.	<b>Contact Address</b>	:	Sr. Scientist & PI, AICRP on PHT (Meat & Meat Products) Livestock Products Technology Dept. College of Veterinary Science AAU, Khanapara, Guwahati – 781002

i.	<b>Name of the Technology</b>	:	Intermediate Spent Chicken Meat
ii.	<b>Application/ Use</b>	:	Meat Processing
iii.	<b>Description of Technology :</b>		
			<p>Deboned leg and breast cuts of spent chicken were placed in between stainless steel sheets and a weight of 100kg was placed for overnight to pressure remove the free water from the meat samples. After removal of free water meat pieces were dry cured by using salt, salt petre and sugar as per formula given below and were stored at 4±1°C for overnight. After storing for overnight, the meat pieces were then tumbled for 1 hour in a vacuum tumbler. Meat pieces then were put in polyethylene bags and stored at 10±1°C for 2 days. Thereafter, the meat pieces were washed thoroughly in running tape water for 1h to remove excess of the curing mixture. The samples were then air dried for 6hours in a clean room.</p> <p>After the air drying process was completed, a thick paste of the spices prepared with fenugreek, garlic, black pepper, red chilli powder and cumin was applied to all sides of the meat pieces in a thick layer and then stored hung at room temperature.</p>
			
iv.	<b>Input/raw material</b>	:	Not Applicable
	a) Overall dimension (L × B × H mm)	:	-
	b) Weight	:	-
	c) Prime mover	:	-
	d) Power (HP)	:	-
	e) Man power	:	-
	f) Land	:	-
	g) Investment	:	-
v.	<b>Output capacity</b>	:	Not defined
vi.	<b>Unit cost (per machine)</b>	:	Not defined
vii.	<b>Suitability for crop/ commodity</b>	:	-
viii.	<b>Efficiency</b>	:	-
ix.	<b>Unit cost of operation</b>	:	-
x.	<b>Patent obtained/applied</b>	:	No
xi.	<b>Commercialization status</b>	:	Nil
	a) No. of Licensees	:	Nil
	b) Addresses of Licensees or Manufacturer	:	Not available
xii.	<b>Contact Address</b>	:	Sr. Scientist & PI, AICRP on PHT (Meat & Meat Products) Livestock Products Technology Dept. College of Veterinary Science AAU, Khanapara, Guwahati – 781002


i.	<b>Name of the Technology</b>	:	Spent Chicken Meat Pickle
ii.	<b>Application/ Use</b>	:	Meat Processing
iii.	<b>Description of Technology :</b>		
			<p>The meaty cuts (breast and legs) of spent chicken were deboned and washed properly. Common salt (1.0% w/w) and sugar (0.5% w/w) were then added and rubbed all over the surface thoroughly. Meat pieces were then vacuum tumbled for 30 minutes and stored at refrigeration temperature for overnight. After storage the meat pieces were cut into small cubes of approximately 1.5cm size and transferred to a wide mouth glass jar/ beaker and filled with vinegar diluted with water in the ratio of 1:3 and further stored for overnight at refrigeration temperature. The excess of the vinegar was then drained off and the meat cubes were allowed to dry for some time at room temperature.</p> <p>The meat cubes were then deep fried in mustard oil with the addition of paste of onion, ginger, garlic, cumin powder, red chilli powder and coriander powder. Initially, the product is cooked at simmering temperature till it is properly done and thereafter it is cooked at high temperature till development of a brownish color on the surface. After cooling to room temperature, the product is stored in PET jar/glass bottles or polyethylene bags and stored at room temperature.</p>
			
iv.	<b>Input/raw material</b>	:	
	a) Overall dimension (L × B × H mm)	:	N.A.
	b) Weight	:	N.A.
	c) Prime mover	:	N.A.
	d) Power (HP)	:	Not Applicable
	e) Man power	:	At least one mandays
	f) Land	:	-
	g) Investment	:	-
v.	<b>Output capacity</b>	:	Not defined
vi.	<b>Unit cost (per machine)</b>	:	Not defined
vii.	<b>Suitability for crop/ commodity</b>	:	Poultry
viii.	<b>Efficiency</b>	:	-
ix.	<b>Unit cost of operation</b>	:	-
x.	<b>Patent obtained/applied</b>	:	No
xi.	<b>Commercialization status</b>	:	Nil
	a) No. of Licensees	:	Nil
	b) Addresses of Licensees or Manufacturer	:	Not available
xii.	<b>Contact Address</b>	:	Sr. Scientist & PI, AICRP on PHT (Meat & Meat Products) Livestock Products Technology Dept. College of Veterinary Science AAU, Khanapara, Guwahati – 781002








i.	<b>Name of the Technology</b>	:	Ready-To-Eat extruded fishery products
ii.	<b>Application/ Use</b>	:	Development of Ready-To-Eat extruded fishery products for retail sale incorporating low value fishes. The process developed will help in proper utilization and value addition to fish species that have little or no commercial value in unprocessed form due to low meat content and poor consumer preference.
iii.	<b>Description of Technology :</b>		
	Food extrusion is relatively a new technology that has been practiced for more than fifty years. In fisheries, the major extrusion work includes the development of product with surimi and soybean protein, extruded rice flour and mince carp, etc. Extrusion cooking is a high temperature short time process with advantage of high versatility. The Kolkata centre standardized the extrusion temperature, moisture and percentage of minced meat incorporation in extruded products developed from minced meat of locally available low value fishes using a twin screw extruder. An optimum production procedure was standardized that may be used to develop extruded fishery products.		
			
iv.	<b>Input/raw material</b>	:	
	f) Overall dimension (L x B x H mm)	:	-
	g) Weight	:	-
	h) Prime mover	:	-
	i) Power (hp)	:	-
	j) Man power	:	-
	k) Land	:	-
	l) Investment	:	-
v.	<b>Output capacity</b>	:	5-10 kg/hr
vi.	<b>Unit cost (per machine)</b>	:	Rs. 8,49,992/-
vii.	<b>Suitability for crop/ commodity</b>	:	Mince of low value fishes
viii.	<b>Efficiency</b>	:	-
ix.	<b>Unit cost of operation</b>	:	-
x.	<b>Patent obtained/applied</b>	:	-
xi.	<b>Commercialization status</b>	:	Product ready for commercialization
	a) No. of Licensees	:	None
	b) Addresses of Licensees or Manufacturer	:	-
	Contact Address	:	PI, AICRP on PHT, Kolkata Centre, Faculty of Fishery Sciences, 5 Budherhat Road, PO: Panchasayar, Kolkata-700094. Tel & Fax: 033-24328763





i.	<b>Name of the Technology</b>	:	Process for extraction of flavor from shrimp waste
ii.	<b>Application/ Use</b>	:	It is estimated that during shrimp processing nearly 80% waste is generated in the form of shrimp head, exoskeleton, hepatopancreas, eye stalk, residual meat and the material lost in liquid form. Utilization of this waste for extracting flavor active compounds will put this waste into useful marketable products. This minimizes the pollution problem and at the same time maximizes the profits of the processors.
iii.	<b>Description of Technology :</b> The flavor of seafood like shrimp flavor is hard to synthesize and it is almost necessary to produce from natural products. Many methods have been reported for isolation of flavor active components and utilization of shrimp wastes. One of the best methods of using shrimp wastes would be its conversion into “value added” products by extracting flavor active components from the waste and using them as useful marketable products. The AICRP on PHT, Kolkata centre attempted a study on shrimp flavor extraction and value addition. During the study, the procedure for extraction of shrimp flavor was standardized using shrimp head.		
iv.	<b>Input/raw material</b>	:	
	a. Overall dimension (L x B x H mm)	:	-
	b. Weight	:	-
	c. Prime mover	:	-
	d. Power (hp)	:	-
	e. Man power	:	-
	f. Land	:	-
	g. Investment	:	-
v.	<b>Output capacity</b>	:	-
vi.	<b>Unit cost (per machine)</b>	:	-
vii.	<b>Suitability for crop/ commodity</b>	:	Shrimp waste
viii.	<b>Efficiency</b>	:	
ix.	<b>Unit cost of operation</b>	:	
x.	<b>Patent obtained/applied</b>	:	-
xi.	<b>Commercialization status</b>	:	Product ready for commercialization
xii.	a) No. of Licensees	:	None
	b) Addresses of Licensees or Manufacturer	:	-
xiii.	<b>Contact Address</b>	:	PI, AICRP on PHT, Kolkata Centre, Faculty of Fishery Sciences, 5 Budherhat Road, PO: Panchasayar, Kolkata-700094. Tel & Fax: 033-24328763

	<b>Name of the Technology</b>	:	Development of fish soup with shrimp flavour
ii	<b>Application/ Use</b>	:	It is estimated that during shrimp processing nearly 80% waste is generated in the form of shrimp head, exoskeleton, hepatopancreas, eye stalk, residual meat and the material lost in liquid form. Utilization of this waste for extracting flavour active compounds will put this waste into useful marketable products. This minimizes the pollution problem and at the same time maximizes the profits of the processors. The shrimp flavour when incorporated in soup yields ready to eat products.
iii	<b>Description of Technology :</b>		
			<p>Shrimp flavour was extracted from shrimp wastes and the application rate of the same was standardized for fish soup. For preparation of fish soup low cost fish was used as raw material and the final product was dried, pulverized and packed. The fish soup powder can be prepared by boiling 5 gms of it in 100 ml of water with addition of shrimp flavour powder. The mixture is boiled for 5 mins and served hot.</p>
			
iv	<b>Input/raw material</b>	:	
	a. Overall dimension (L x B x H mm)	:	-
	b. Weight	:	-
	c. Prime mover	:	-
	d. Power (hp)	:	-
	e. Man power	:	-
	f. Land	:	-
	g. Investment	:	-
v	<b>Output capacity</b>	:	-
vi	<b>Unit cost (per machine)</b>	:	-
vii	<b>Suitability for crop/ commodity</b>	:	Shrimp waste, low valued fish.
viii	<b>Efficiency</b>	:	-
ix	<b>Unit cost of operation</b>	:	-
x	<b>Patent obtained/applied</b>	:	-
xi	<b>Commercialization status</b>	:	Product ready for commercialization
	a) No. of Licensees	:	None
	b) Addresses of Licensees or Manufacturer	:	-
xii	<b>Contact Address</b>	:	PI, AICRP on PHT, Kolkata Centre, Faculty of Fishery Sciences, 5 Budherhat Road, PO: Panchasayar, Kolkata-700094. Tel & Fax: 033-24328763

i.	<b>Name of the Technology</b>	:	Development of Vegetable soup with shrimp flavour
ii.	<b>Application/ Use</b>	:	It is estimated that during shrimp processing nearly 80% waste is generated in the form of shrimp head, exoskeleton, hepatopancreas, eye stalk, residual meat and the material lost in liquid form. Utilization of this waste for extracting flavour active compounds will put this waste into useful marketable products. This minimizes the pollution problem and at the same time maximizes the profits of the processors. The shrimp flavour when incorporated in soup yields ready to eat products.
iii.	<b>Description of Technology :</b> Shrimp flavour was extracted from shrimp wastes and the application rate of the same was standardized for vegetable soup. For preparation of vegetable soup tomatoes, carrots, beans and cabbage were used as raw material and mixed with white sauce. The vegetable soup powder is served after addition of 15% shrimp flavour powder.		
iv.	<b>Input/raw material</b>	:	
	a. Overall dimension (L x B x H mm)	:	-
	b. Weight	:	-
	c. Prime mover	:	-
	d. Power (hp)	:	-
	e. Man power	:	-
	f. Land	:	-
	g. Investment	:	-
v.	<b>Output capacity</b>	:	-
vi.	<b>Unit cost (per machine)</b>	:	-
vii.	<b>Suitability for crop/ commodity</b>	:	Shrimp waste, vegetables.
viii.	<b>Efficiency</b>	:	-
ix.	<b>Unit cost of operation</b>	:	-
x.	<b>Patent obtained/applied</b>	:	-
xi.	<b>Commercialization status</b>	:	Product ready for commercialization
	a) No. of Licensees	:	None
	b) Addresses of Licensees or Manufacturer	:	-
xii.	<b>Contact Address</b>	:	PI, AICRP on PHT, Kolkata Centre, Faculty of Fishery Sciences, 5 Budherhat Road, PO: Panchasayar, Kolkata-700094. Tel & Fax: 033-24328763


i.	<b>Name of the Technology</b>	:	Low calorie ice cream (using stevia powder) for diabetic patients
ii.	<b>Application/ Use</b>	:	As a dessert for calorie conscious people
iii.	<b>Description of Technology:</b>		<p>Low calorie ice cream could be prepared from milk cream, Skimmed milk powder, Raftline (as a fat replacer), Sorbitol powder (fat replacer), Stevia (as a sugar replacer), Stabilizers (Gaur gum (as a stablizer) and Carrageenan (stabilizer) , in ratio 5:2 respectively) and Emulsifier (80% GMS (emulsifier) and 20% Polysorbate 80(as a emulsifier). All mixes contained 11% milk SNF, and varied amount of fat, raftline, sorbitol, stevia, stabilizers and emulsifiers. Four kilogram ice cream mix was made per batch and heated to 80 °C held for 25 s, homogenized in two stages (1000 psi and then 500 psi), cooled at 4°C and held for 8 hrs. After ageing vanilla flavor (2.35 ml/kg ice cream mix) was added and frozen in a 10 liter batch ice cream freezer. Ice cream was frozen (40-60 min) till the product achieved sufficient stiffness to almost hold its shape. The frozen ice cream was hardened at -18 to -20°C in a deep freezer.</p>
			
iv.	<b>Input</b>	:	
	a) Raw material		Milk, SMP, stabilizers and stevia
	b) Machinery		<p>Mixing Hopper- 40 kg</p> <ul style="list-style-type: none"> <li>- Mixing Hopper -40 kg (stainless steel unit used for mixing dried ingredients)</li> <li>- Balance Tank – 100 lit. (for mixing dry and wet ingredients)</li> <li>- Chiller – 100lit/hr</li> <li>- Pasteurizer (Batch) – 100lit.</li> <li>- Ice cream Freezer – 40 lit.</li> <li>- Hardening chamber /Deep freezers (100lit.)</li> </ul>
	• Overall dimension	:	NA
	• Weight	:	NA
	• Prime mover	:	NA
	c)Man power	:	NA
	d) Land	:	NA (Existing ice cream manufacturing unit can take up additional activity for production of low calorie ice cream)
	f) Investment	:	No extra investment in case manufacturing in existing unit
v.	<b>Output capacity</b>	:	NA
vi.	<b>Unit cost</b>	:	Rs. 8 per 200 ml cup
vii.	<b>Suitability for crops/ commodity</b>	:	Milk
viii.	<b>Efficiency</b>	:	43.75 % less calorie (Contains 99 kcal/100 ml as compared to normal ice cream (176 kcal/100 ml)
ix.	<b>Unit cost of operation</b>	:	Rs. 11.5 per liter (Cost of added ingredients such as: Raftline, Sorbitol powder, Stevia, guar gum/ Carrageenan, etc
x.	<b>Patent obtained/applied</b>	:	NA
xi.	<b>Commercialization status</b>	:	Ready for commercialization
xii.	<b>Contact address</b>	:	Head, Department of Process and Food Engg, College of Tech., G. B. Pant University of Agriculture & Tech., Pantnagar - 263 145 (Uttaranchal)

i.	<b>Name of the Technology</b>	:	Value Added Product (fish pickle) using Low Value Fresh Water Fishes ( <i>Tilapia sp.</i> ).
ii.	<b>Application/ Use</b>	:	The utilization of low value under utilized fish for the preparation of value added products will enhance the economics of the fishing community and their profitability. At present shores are dumped with trash fish, causing water and soil pollution. The on and off shore environment will be protected.
iii.	<b>Description of Technology :</b>		
			<p>The fresh water fishes (small size) are abundantly available in local ponds. These fishes have no commercial value because of their smaller size and they become nuisance in the pond as these species compete with the commercially high value fishes for the food.</p> <p><b>Procedure:</b> Procure low value fresh water/marine fish. Remove the scalp, head and scales and separate the abdominal organs. Cut the fishes in to pieces and clean properly with fresh water. Mix the fish pieces with salt in 5:1 ratio by weight and keep for 24 hours. Drain the water and steam the pieces in a pressure cooker for 10 min. and follow the standard procedure of pickling. Fry the spice ingredients in oil and mix with steamed fish pieces. Add lemon juice (10% by weight) and vinegar (6% by weight) and mix thoroughly. To prevent the fungal growth, 1 gm. Benzoic acid per kg of pickle may be mixed as a preservative. The pickle can be stored in glass jar, pearl pet jar and polyethylene pouches for a period of 12, 9, and 6 months respectively.</p>
			
iv.	<b>Input/raw material</b>	:	Fish, spices, oil, lemon, vinegar and benzoic acid
	a) Overall dimension	:	N.A.
	b) Weight	:	N.A.
	c) Prime mover/ Plant & Machinery	:	N.A.
	d) Man power	:	One person
	e) Land	:	N.A.
	f) Investment	:	N.A.
v.	<b>Output capacity</b>	:	as per the requirement
vi.	<b>Unit cost (per machine)</b>	:	Rs.150/- per kg of pickle
vii.	<b>Suitability for crops/commodity</b>	:	Low value and under utilized fishes
viii.	<b>Efficiency</b>	:	NA
ix.	<b>Unit cost of operation</b>	:	Rs. 60-80 /per kg
x.	<b>Patent obtained/applied</b>	:	NII
xi.	<b>Commercialization status</b>	:	Ready for Commercialization
	(a) No. of Licensees to whom the technology has been transferred	:	25 Fishermen of Raichur district
	(b) Selected Addresses of Licensee/Manufacturer	:	-
xii.	<b>Contact Address</b>	:	Sr. Scientist & PI, AICRP on Post Harvest Technology Dept. of Processing and Food Engineering, College of Agricultural Engineering, UAS, Raichur.

i.	<b>Name of the Technology</b>	:	Value Added Product (fish sausage) by using Low Value Marine and Freshwater Fish.
ii.	<b>Application/ Use</b>	:	The developed indigenous technology provides hygienically processed value added fish products for the domestic and export markets using under-utilized and low value fish harvested from marine and fresh water sources.
iii.	<b>Description of Technology :</b> Procure fresh Bull's eye fish ( <i>Priacanthus hamurur</i> ) from the fish landing centre in iced condition. Dress the fishes to remove scales, head and viscera and then wash in clean chilled water. Separate the meat from the bones using meat picking machine. Reduce the size of the meat in a meat mincer. Add the spices with minced meat as per the standard recipe and grind the mixture in a silent cutter for 10-15 min. Transfer the fine paste in sausage filler and stuff the paste into synthetic casing. Ring the sausage using aluminium wire. Wash the outer surface of the casing in soap water and then in clean water. Thermally process the sausages at 80-90°C for 45 min. and allow them to get cooled to the room temperature. Re-boil the sausages at 100°C for one minute to remove the wrinkles and to get smooth appearance. The sausages can be wiped and stored in refrigerated condition (5 ± 2°C) or in a deep freezer (-20°C) for a period of 28 days and 6 months respectively.		
iv.	<b>Input/raw material</b>	:	Fishes, spice ingredients, refined vegetable oil, synthetic aluminium wire
	a) Overall dimension	:	N.A.
	b) Weight	:	N.A.
	c) Prime mover/ Plant & Machinery	:	Cleaning table, meat picking machine, silent cutter, pressure cooker, sausage filler, sausage ringer etc.
	d) Power	:	N.A.
	e) Man power	:	Two persons
	f) Land	:	N.A.
	g) Investment	:	N.A.
v.	<b>Output capacity</b>	:	As per the requirement
vi.	<b>Unit cost (per machine) / selling cost</b>	:	Rs. 200/- per kg
vii.	<b>Suitability for crops/commodity</b>	:	Low value or under utilized fishes
viii.	<b>Efficiency</b>	:	NA
ix.	<b>Unit cost of operation</b>	:	Rs. 76-85 /kg
x.	<b>Patent obtained/applied</b>	:	Nil
xi.	<b>Commercialization status</b>	:	Ready for commercialization
	(a) No. of Licensees to whom the technology has been transferred	:	4 Fishermen and one entrepreneur
	(b) Selected Addresses of Licensee/Manufacturer	:	-
xii.	<b>Contact Address</b>	:	Sr. Scientist & PI, AICRP on Post Harvest Technology College of Agricultural Engineering, UAS, Raichur

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i.	<b>a. Type of Technology</b>	:	Process
	<b>b. Technology developed</b>	:	Value Added Product (Fish Balls) Using Low Value Marine Fish (Squilla)
ii.	<b>Application/ Use</b>	:	Indian fishery is multi-species and the catch consists of some very small sized fishes, which often cannot be put to any economic use. Such fish catch is discarded over board or at landing centres. The low value fish constitute a sizable part of the countries' total marine catches. Discarding of these fishes, which are rich in protein, is therefore, a loss to the nation where such cheap protein food is very much needed. The producers and processors reject these fishes only because they don't have any commercial value. The developed technology helps the grass root fishermen to utilize low value and underutilized fishes, through processing and preparation of value added products acceptable to the consumers.
iii.	<b>Description of Technology :</b> Procure low value fish (Squilla) from landing centre in iced condition, dress the squilla to remove head and shell, wash in clean chilled water. Blanch the Squilla by using saturated brine solution and boil for about 10-15 minutes. Allow the blanched meat to get dried and then make a fine paste in a grinder and cook for 10 min in pressure cooker. To prepare the masala, cook the potatoes, make a fine paste and mix with spice ingredients. Fry onion and ginger in oil and mix thoroughly with blanched meat along with masala paste. Prepare the balls of 25 gm each, dip in egg white and roll in bread crumbs. The balls are packed in polyethylene pouches and can be stored in deep freezer (-20°C) up to 120 days without spoilage. The frozen fish balls can be fried in oil at 160 – 170°C for 4 – 5 min and served with tomato sauce.		
iv.	<b>Input/raw material</b>	:	Squilla, spice ingredients, refined vegetable oil, bread crumbs, egg white, salt.
	a) Overall dimension	:	N.A.
	b) Weight	:	N.A.
	c) Prime mover/ Plant & Machinery	:	Cleaning table, Grinder, pressure cooker
	d) Power	:	NA
	e) Man power	:	Two persons
	f) Land	:	NA
	g) Investment	:	NA
v.	<b>Output capacity</b>	:	As per the requirement
vi.	<b>Unit cost (per machine) /cost of selling</b>	:	Rs. 150/- kg
vii.	<b>Suitability for crops/commodity</b>	:	All kinds of fishes
viii.	<b>Efficiency</b>	:	NA
ix.	<b>Unit cost of operation</b>	:	Rs. 55-60/kg
x.	<b>Patent obtained/applied</b>	:	NII
xi.	<b>Commercialization status</b>	:	Ready for commercialization
	(a) No. of Licensees to whom the technology has been transferred	:	20 Fishermen and one entrepreneur
	(b) Selected Addresses of Licensee/Manufacturer	:	
xii.	<b>Contact Address</b>	:	Sr. Scientist, AICRP on Post Harvest Technology College of Agricultural Engineering, UAS, Raichur