

## Research projects completed in the faculty

Sr. No	Name of research projects	Sponsored agency	Year
<b>On going research projects</b>			
1	All India coordinated Research Project on Arid Legumes (AICRP)	ICAR, New Delhi	1995- till to date
2	Network project on Harvesting, Processing and Value addition of Natural Resins and Gums	Indian Institutes of Natural Resins and Gums, ICAR, New Delhi	2008- till to date
3	Post Harvest Technology (PHT)	State Govt. of Maharashtra	1982- till to date
4	Establishment of Common Incubation Center ( <b>329.50 Lac.</b> ): Jaggery Processing Spices Processing and Sugar Cane Juice Bottling	PMFME, MOFPI, New Delhi	2022
5	Development of Post-Harvest Technology/Management and Value added products from freshly harvested turmeric rhizome ( <b>5 lac.</b> )	Rajiv Gandhi Science and Technology Commission Government of Maharashtra	2023
6	Standardization of process technology and quality evaluation of multimillet based porridge mix ( <b>5 lac</b> )	Rajiv Gandhi Science and Technology Commission Government of Maharashtra	2023
7	Waste to wealth: Developing food grade table ware from onion leaves ( <b>5 lac</b> )	Rajiv Gandhi Science and Technology Commission Government of Maharashtra	2023
<b>Completed Research Projects</b>			
4	Development of Agro Based Nutraceuticals for Health Security	Niche Area of Excellence ICAR, New Delhi	2009-2012
5	Development of noni ( <i>Moringacitrifolia</i> ) based nutraceutical for health security	World noni research foundation, Chennai	2009-2012
6	Erection of ginger and turmeric processing demonstration plant	MAU, Parbhani	2006-2008
7	Post harvest management and processing of wasteland fruits for sustainable economic rural transformation through demonstration	Ministry of food processing industries, GOI, New Delhi	2005-2007
8	Utilization of dairy byproducts in fruit flavored beverages	ICAR, New Delhi	2004-2006
9	Spices (Ginger and Turmeric) quality evaluation and processing	IPDS Project, spice board	2004-2005
10	Development of process for extraction of oil from marking nut	ATMA, Aurangabad	2001-2002
11	Value addition of safflower petals for natural dyes and herbal health care products (ROPS-1)	NATP (World Bank), ICAR, New Delhi	2000-2003
12	Development of technology for processing and marketing of sweet orange	State horticulture board	1999-2002
13	Demonstration of post harvest management of pomegranate	National horticulture board	1999-2001
14	Development of dehydration of vegetables`	National horticulture board	1999-2001
15	National center for custard apple quality	Ministry of food processing	1999-2000

	improvement and processing	industries, GOI, New Delhi	
16	Development of mushroom processing	Directors of horticultural, Pune (MS)	1999-2000
17	Post harvest technology of fruits	Agricultural consultancy and self-employment programme of Govt. of Maharashtra	1996-1999
18	An exploration of agriculture wastes- A Biomass for the production of xylitol and its application in food stuffs	ICAR, New Delhi	1995-1998
19	Studies on production, physico-chemical, biochemical and rheological characteristics and uses of newer source of industrially potential gums	U.S Dept. of Agriculture, Indo US, Project (PL480)	1990-1995
20	Effect of sporting and cooking on nutritional functionality of moth bean and horse gram	ICAR, New Delhi	1985-1990
21	Studies on physico-chemical, biochemical functional properties and utilization of products and by-products of banana	ICAR, New Delhi	1983-1985
22	Studies on food colloids and biomass utilization with special reference to biochemical, nutritional and food application (under active consideration)	U.S Dept. of Agriculture, Indo US, Project (PL480)	1983-1985
23	induce malting of sorghum and malt utilization of different food products	ICAR, New Delhi	1983-1985
24	Utilization of Indian sorghum malt in brewing	ICAR, New Delhi	1983-1985
25	Improvement of nutritional and bread making quality of grain sorghum	ICAR, New Delhi	1982-1985
26	Studies on dietary fiber of moth bean and horse gram	ICAR, New Delhi	1982-1983
27	Biochemical, rheological and nutritional studies on cultured milk products with special reference to dahi and yoghurt	ICAR, New Delhi	1982-1983
28	Studies on preparation, physico-chemical and rheological attributes of banana milk beverages	ICAR, New Delhi	1982-1983
29	Study of casual factors for low shelf life of hybrid sorghum	ICAR, New Delhi	1981-1983
30	Studies on processing and utilization of safflower meal for edible purpose	ICAR, New Delhi	1979-1981

Recommendation	Project Scientists
2008-09	

<b>Transparent, less sweet, better quality Aonla Candy in short processing period can be prepared by using 2.5 per cent calcium carbonate and Modified method</b>	Dr. Shivpuje P.R. Prof. Satwadhar P.N. Prof. Deshpande H.W. Mr. Jadhav B.A. Mr. Syed K.A.
---	---

2009-10	
<b>MAU developed technology for preparation of Noni enriched nutraceutical cookies from Noni Powder is recommended</b>	Prof.P.N. Satwadhar Prof. H.W. Deshpande Syed K. Arifuddin
<b>MAU developed technology of using spray dried custard apple powder for preparation of ice- cream is recommended.</b>	Prof. Pawar .V.N Prof. Syed Imran Hashmi Deothankar H.M.
<b>MAU developed technology for preparation of blended RTS from Noni Juice is recommended.</b>	Prof. Satwadhar P.N. Prof. H.W. Deshpande Syed K. Arifuddin, Mr. B.A. Jadhav and Syed Imran Hashmi

2010-11
---------

<b>Low calorie Ice-cream can be prepared by using 40% matodextrin as fat replacer.</b>	A.B.Rodge
--	-----------

2011-12	
<b>Marathwada Krishi Vidyapeeth, Parbhani developed whey fruit juice health beverage technology containing 1.83/100ml lycopene as a standard recipe is recommended.</b>	Pawan V.N Deothankar H.M. Agarkar B.S.
<b>Marathwada Krishi vidyapeeth, Parbhani developed, low calorie, health enhancing diet ice cream technology, containing 40% maltodextrin as a standard recipe is recommended.</b>	Pawar V.N . Rodge A.B. Lamdande A.G. Shinde V.S
<b>Marathwada Krishi vidyapeeth, Parbhani developed, Curcumin (0.075 percent) enriched flavored skim milk health beverage technology is recommended</b>	Pawar V.N. Sawate A.R. Yadav G.B. Khirsagar R.B.

2012-13
---------

<b>Fig Burfi with superior characteristics with better nutritional quality can be prepared by using 12.5 per cent fig powder</b>	Prof.P.N. Satwadhar P.N.Shinde Prof. H.W. Deshpande Khapre A.P. Syed Imran Hashmi
<b>MKV released <i>Parbhani Moti</i> cultivar of sorghum is recommended for flakes and <i>chiwda</i> (snacks) making</b>	More D.R., Satwadhar P.N., Syed Imran Hashmi, Waseem M.M.
<b>Good quality pomegranate mouth freshener can be prepared</b>	Syed H.M., Rodge A.B., Ghatge P.U.
<b>Marathwada Krishi Vidyapeeth, Parbhani developed standard recipe of multi-grain cookies containing 50% oat, 30% soy and 20% wheat flour respectively as an innovative product is recommended as nutritional technology goodness way.</b>	Shere D.M., Pawar V.N. and Pawar V.S.
<b>Marathwada Krishi Vidyapeeth, Parbhani developed standard recipe of flaxseed oil enriched ice cream containing 3% spray dried encapsulated flaxseed powder is recommended as an innovative dietetic nutritious ice cream</b>	Rohit T., Gadhe K.S. and Pawar V.N.

<b>Tamarind squeeze with 0.3% guar gum maintain the quality attributes</b>	Rodge A.B., Jadhav B.A.

2013-14	
<b>For preparation of Fig Toffee 22.5 per cent fig powder and for Noni Fortified fig Toffee 22.5 percent fig powder with 15 per cent Noni Juice is recommended.</b>	Satwadhar P.N. Deshpande H.W. More D.R. Syed Imran Hashmi Khapre A.P.
<b>Parbhani Moti and Phule Panchmi cultivars of sorghum are recommended for popping</b>	More D.R. Satwadhar P.N. Syed Imran Waseem M.M.

<p><b>Wheat grass juice, processed under standard conditions (wheat germination -12 hr, WG-7 days, height 18-20 cm, temperature 28±2°C) and confirmed for therapeutic efficacy (anthropometric and biochemical parameters) by utilizing human subjects, is recommended as mid morning fresh green health beverage</b></p> <p><b>Salient Features:</b></p> <ol style="list-style-type: none"> <li><b>1) Blood pressure modulation</b></li> <li><b>2) Blood serum cholesterol reduction</b></li> <li><b>3) Caronary heart disease risk factor modulation.</b></li> </ol>	<p>Pawar V.N</p> <p>Joshi S.M.</p> <p>Kadam G.V</p>
--	---

2014-15	
<p><b>Development of technology for production of tamarind leather with addition of guar gum</b></p>	<p>Pawar V.S.</p> <p>Jadhav B.A</p> <p>Joshi A.A.</p> <p>Bhokre C.K.</p>
<p><b>For the production of good quality dehydrated banana slices, Banana Slices of Grand Naine variety pretreated in 0.5% ascorbic acid and 3% salt solution for 10 minutes followed by drying at 60°C for 8 hrs in cabinet drier is recommended.</b></p>	<p>Satwadhar P.N.</p> <p>Deshpande H.W.</p> <p>More D.R.</p> <p>Syed Imran Hashmi</p>

<b>It is recommended to use sorghum cultivar Parbhani Moti and VNMKV , Parbhani developed technology for production sorghum papad and sorghum- ragi papad</b>	More D.R. Satwadhar P.N Deshpande H.W. Syed Imran Hashmi

2015-16	
<b>It is recommended that good quality Aonla Candy can be prepared by replacing white sugar with honey (for medicinal value) or gaggery (for high minerals).</b>	R.B. Kshirsagar A.R. Sawate Nidhi Agrawal B.M. Patil
<b>Turmeric rhizomes shreds (Variety- Salem) with the addition of 15% ginger shreds and 20% lime juice is recommended to make quality turmeric pickle.</b>	R.B. Kshirsagar A.R. Sawate A.T. Taur B.M. Patil

2016-17
---------



<b>It is recommended to prepare good quality multigrain roti with 60% sorghum and each of 13.33 percent finger millet, amaranth and Soya bean</b>	R.B. Kshirsagar A.R. Sawate A.T. Taur B.M. Patil
<b>It is recommended to use VNMKV, Parbhani developed technology for production of Instant sorghum flakes from Parbhani Moti Cultivar.</b>	D.R. More P.N. Satwadhar

Technology for preparation of vegetable butter with utilization of guar gum  Syed H.M, Jadhav B. A. and Ghatge P.U.	2017-18 Dr. BSKKV, Dapoli
Development of nutraceutical capsules from different parts (Leaf, flower and pod) of drumstick  Kshirsagar R.B., Sawate A.R. and Patil B.M.	2017-18 Dr. BSKKV, Dapoli
A process development of fenugreek puree noodles. Shere D.M., Sawate A.R. Gadhe K.S. and Pawar V.S.	2018-19 MPKV, Rahuri
Development of technology watermelon rind candy by using different flavors  Gadhe K.S., Sawate A.R. and Shere D.M.,	2018-19 MPKV, Rahuri
Standardization of process technology of Jamun bar  Pawar V.S., Sawate A.R. and Shere D.M.	2018-19 MPKV, Rahuri
Standardization of formulation and evaluation of Turmeric based Orange ( <i>Citrus sinensis</i> ) RTS Beverage	2018-19 MPKV, Rahuri

Kshirsagar R.B., Sawate A.R., Agarkar B.S., Patil B.M. and Mane R.P.	
Development of process technology of mixed fruit leather from Bael ( <i>Aegle marmelos</i> ) and Aonla ( <i>Emblica officinalis</i> )  Agarkar B.S., Sawate A.R., Kshirsagar R.B and Patil B.M.	2018-19  MPKV, Rahuri
Technology Development for Preparation of Nutra Laddu by Incorporation of Linseed, Amaranth and Guar Gum  Jadhav B.A., Sawate A.R., Syed H.M and Ghatge P.U.	2018-19  MPKV, Rahuri
Technology Development for Probiotic Shrikhand.  Deshpande H.W., Sawate A.R., Machewad G.M. and Katke S.D.	2018-19  MPKV, Rahuri
Assessment of physico-chemical and nutrition properties of Quinoa Seed ( <i>Chenopodium Quinoa Wild</i> ) and its exploration in Cookies  More D.R. Sawate A.R. and Nisar Mohammad	2018-19  MPKV, Rahuri

Development of Post Harvest Technology and Management of tender Sweet Sorghum More D.R., Samarth A.G and Shinde D.D	2019-20 PDKV, AKOLA
Standardization for Development of Lime (Citrus aurantifolia L.) RTS Beverage with Incorporation of Spice Extract. Gadhe K.S., Sawate A.R. , Kshirsagar R.B. and Walhekar R.D.	2019-20 PDKV, AKOLA
Technology development for preparation of aonla fruit balls from whole aonla fruits Ghatge P.U., Sawate A.R., Syed H.M. and Jadhav B.A.	2019-20 PDKV, AKOLA
Standardization and technology development for preparation of fiber rich cookies by utilization of guar hull. Kshirsagar R.B., Sawate A.R., Jadhav B. A. & Khapre A.P.	2019-20 PDKV, AKOLA
Development of technology for production of low fat chocolate flavored milk by fortification of guar and arabic gum blend Kshirsagar R.B., Sawate A.R., Jadhav B. A. and Thakur P.P.	2019-20 PDKV, AKOLA
Development of Technology For Whole Lime - Aloe vera Based Spread Kshirsagar R B, Sawate A R, Agarkar B S and Patil B M	2019-20 PDKV, AKOLA
Development of Probiotic Chocolate by using Bael Fruit Extract as Prebiotic Deshpande H.W., Sawate A.R., Machewad G.M. and Katke S.D.	2019-20 PDKV, AKOLA
Development and quality evaluation of Sesame - flaxseed nutra <i>chikki</i> Pawar V.S., Sadawarte S. K. and Shinde E. M.	2019-20 PDKV, AKOLA

2019-20

1. **Title** : **Development and quality evaluation of Sesame – flaxseed nutra *chikki***

---

Project Scientists : Dr. Pawar V.S.  
Prof. Sadawarte S. K  
Shinde E. M.

**Recommendation:**

For the preparation of good quality, acceptable sesame flaxseed nutra *chikki* utilization of 30 % flaxseed is recommended. The shelf life of prepared sesame flaxseed nutra *chikki* was 3 months at room temperature.

2. Title : Standardization for development of lime (*Citrus aurantifolia L.*) RTS beverage with incorporation of spice extract

Project Scientists : Gadhe K.S.  

---

Walhekar R.D.

**Recommendation:**

A good quality acceptable spice extract incorporated lime RTS can be prepared by adding with 10 percent lime juice, 0.9 percent spice extract and 0.3% acidity. Jaggary used as a sweetener maintaining 12 degree brix.

3. Title : Studies on process standardization of Jamun bar  
Project Scientists : Pawar V.S.  
Sawate A.R.  
Shere D.M.

**Recommendation:**

For the preparation of good quality, acceptable natural jamun bar utilization of only pulp recommended. The shelf life of prepared jamun bar was six month with packaging in aluminium foil at room temperature.

**4. Title : Studies on Formulation and Evaluation of  
Turmeric  
based Orange (Citrus sinensis) RTS Beverage**

Project Scientists :Kshirsagar R.B.  
Sawate A.R.  
Agarkar B.S.  
Patil B.M.  
Mane R.P.

**Recommendation:**

**For the preparation of good quality, fresh turmeric rhizome based orange RTS beverage, the addition of 10 percent fresh turmeric rhizome juice in 90 percent orange juice is recommended.**

**5. Title : Studies on development and evaluation of mixed fruit  
leather  
from Bael (*Aegle marmelos*) and Aonla (*Emblica officinalis*)**

Project Scientists : Agarkar B.S.  
Sawate A.R.  
Kshirsagar R.B  
Patil B.M.

**Recommendation:**

**The use of bael fruit pulp and aonla fruit pulp in 50:50 proportions with addition of 30 percent sugar and 0.1 percent citric acid is recommended for the preparation of good quality mixed fruit leather. The aluminium foil packaging is recommended for its better storage.**

**6. Title : Technology development for preparation of aonla  
fruit  
balls from whole aonla fruits**

Project Scientists : Ghatge P.U.

Sawate A.R.

Syed H.M

Jadhav B.A.

**Recommendation:**

**It is recommended that good quality of aonla fruit balls prepared by treating with salt (3%), alum (2%) and blending whole fresh aonla fruits to sugar ratio (1:1) for 22 days and drying at 55°C for 5.5h.**

**7. Title : Technology Development for Preparation of Nutra Laddu by**

**Incorporation of Linseed, Amaranth and Guar Gum**

Project Scientists : Jadhav B.A.

Sawate A.R.

Syed H.M

Ghatge P.U.

**Recommendation:**

**Good quality of nutra laddu prepared by using linseed (40%), popped amaranth (20%), jaggrey (30%), honey (10%) and guar gum (0.3%) is recommended.**

**8. Title : Technology Development for Probiotic Shrikhand.**

Project Scientists : Deshpande H.W.

Sawate A.R.

Machewad G.M.

Katke S.D.

**Recommendation:**

**It is recommended that good quality, acceptable probiotic *shrikhand* can be prepared by adding 0.75 per cent Psyllium husk and 2 per cent lactic acid bacteria.**

**9. Title : Studies on physico-chemical and nutrition properties of**

**Quinoa Seed (*Chenopodium Quinoa Wild*) and its  
exploration in Cookies**

Project Scientists : More D.R.  
Sawate A.R.  
Nisar Mohammad

**Recommendation:**

**The antinutritional factor Saponin, in Quinoa seeds can be significantly reduced by soaking the seeds in 2% citric acid solution for overnight. Cookies can be prepared by using 40% Quinoa flour with better nutritional and sensorial properties**

2020-21

1. Title : Development and quality evaluation of chocolate coated date moth bean bar

Project Scientists : Dr. Pawar V.S. , Deshmukh B.A.

**Recommendation**

For preparation of chocolate coated date moth bean bar use of 50% dark chocolate, 40% date paste and 10% moth bean malt and storing it at 5°C up to 60 days is recommended.

2. Title : Utilization of horse gram malt in rice based nutrifood

Project Scientists : Dr. Sadawarte S. K., Dr. Pawar V.S.

**Recommendation**

Use of rice flour, horse gram malt, sugar, carrot powder and milk powder in the proportion of 60:20:10:5:5 for preparation of low density rice based nutrifood is recommended.

3. Title : Studies on Quality Evaluation of Probiotic Beverage Prepared from Carrot and Tomato Juice

Project Scientists : H.W.Deshpande, G.M.Machewad, S. D. Katke

**Recommendation**

It is recommended that good quality acceptable probiotic beverage can be prepared by carrying out 20 hours fermentation of carrot and tomato juice (70:30 and 16<sup>0</sup>Bx) inoculated using 10 percent mixed culture of *Lactobacillus acidophilus* and *Saccharomyces boulardii* (1:1).

4. Title : Exploitation and value addition of Broccoli (*Brassica Oleracea* L.) Powder in Functional Food.



**Project Scientists** : K.S.Gadhe, V.B.Wadmare, R.B. Kshirsagar, P.U. Ghatge

**Recommendation**

**Preparation of good quality instant Broccoli tomato soup mix by using mainly 15 percent broccoli powder and 45 percent Tomato powder is recommended.**

5. **Title** : Technology for preparation of flaxseed fortified cookies

**Project Scientists** : P.U. Ghatge, K. S. Gadhe and A. R. Sawate

**Recommendation**

**It is recommended that good quality nutra cookies prepared by using mainly refined wheat flour and roasted flaxseed flour in the ratio of 90:10.**

6. **Title** : **Studies on Development of RTS beverage of Kiwi fruit (*Actinidia deliciosa*) incorporated with Lemongrass (*Cymbopogon citratus*)**

**Project Scientists** : Kshirsagar R. B., Agarkar B.S., Patil B.M. , A.P. Khapre

**Recommendation**

**It is recommended to prepare good quality kiwi fruit - lemongrass RTS beverage by using kiwi fruit juice and lemongrass concentrated extract 10:2 proportion which has considerable ascorbic acid content.**

**Title**

7. : **Development of process technology of nutritionally enriched noodles blended with sorghum flour**

**Project Scientists** : B.S. Agarkar, R.B. Kshirsagar, B.M. Patil, A.P. Khapre

### **Recommendation**

**It is recommended to prepare the noodles with improved nutritional and sensory qualities by using 90 per cent composite flour (70% wheat flour+30% sorghum flour) blended with 10 per cent chia seeds powder.**

- 8. Title : Development of Crackers (Pet Dog Food) by Incorporation of Guar Meal Protein Isolate**

**Project Scientists : R.B.Kshirsagar, B. A. Jadhav, Thakur P. P.**

### **Recommendation**

**It is recommended that the pet dog food crackers should be prepared by incorporation of 15% Guar Meal Protein Isolate to have higher protein content and palatability as per single bowl test.**

- 9 Title : Standardization of pizza sauce using partially hydrolyzed guar gum**

**Project Scientists : R.B.Kshirsagar, B. A. Jadhav, Thakur P. P.**

### **Recommendation**

**Preparation of Pizza Sauce having higher acceptability and high content of dietary fibre using 7% partially hydrolyzed guar gum (PHGG) is recommended.**

**2021- 2022**

- 1. Title : Quality Evaluation of Gluten Free Flat Bread (*Roti*) Made From Different Varieties of Sorghum**

**Project Scientists : Dr. V.S. Pawar, Dr. L.N. Jawale, A. H. Bachate and  
Dr. Khapre A.P.**

### **Recommendation**

**Roti prepared from sorghum variety Parbhani Super Moti flour with particle size of 250 µm is stored for 1 day at room temperature (27±3<sup>0</sup> C)**

and 7 days at refrigerated temperature is recommended.

- 2. Title** : Studies on Technology Development For Cereal And Legume Based Nutri Food

**Project Scientists** : Dr. S.K. Sadawarte, Dr. V.S. Pawar, Prof. S.M. Sonkamble and Shingote A.B.

**Recommendation**

It is recommended to use the Rice flour : Sorghum flour : Sugar : Green gram malt : Ragi malt in the proportion of 55:10:15:10:10 for preparation of low density nutritious food.

- 3. Title** : Standardisation and quality evaluation of millet based instant appe mix powder

**Project Scientists** : Kshirsagar R. B., Sawate A. R., Agarkar B.S., Patil B.M. and Wandhekar S. S.

**Recommendation**

It is recommended to use Rice: Black gram: Finger millet: Foxtail millet in the proportion of 40:20:20:20 to prepare instant appe mix powder for a good organoleptic quality, nutritious, specially rich in minerals and fiber content appe.

- 4. Title** : Studies on development of technology for production of khakhra incorporated with mixed green leafy vegetables

**Project Scientists** : Patil B.M., Kshirsagar R. B., Sawate A. R. and Agarkar B.S.

**Recommendation**

For the preparation of nutritious and organoleptically accepted khakhra, the incorporation of 10 per cent dried mixed green

leafy vegetables containing fenugreek, amaranth and roselle leaves (1:1:1) is recommended.

5. **Title** : “Studies on Development of Mixed Fruit Bar Fortified with Whey Protein Concentrate”

**Project Scientists** : B.S. Agarkar, R.B. Kshirsagar , B.M. Patil and A.P. Khapre

#### **Recommendation**

It is recommended that good organoleptic quality, nutritious mixed fruit bar is prepared from mixed fruit pulp (60% mango and 40% guava pulp) fortified with 5% whey protein concentrate.

6. **Title** : Studies on Development of Instant Vegan Beverage Powder using rolled oat and Dates

**Project Scientists** : K.S.Gadhe, Syed Samar and P. U. Ghatge

#### **Recommendation**

It is recommended that good quality Instant vegan beverage powder is prepared by using rolled oat and date in the ratio 60:40, 15% maltodextrin and 2% vanilla flavour.

7. **Title** : Development and quality evaluation of nutri-beverage by incorporation of horse gram malt.

**Project Scientists** : P.U. Ghatge, K. S. Gadhe and S.S. Gaikwad

#### **Recommendation**

It is recommended that good quality nutri-beverage mix is prepared by addition of roasted finger millet flour, whole wheat flour and

horsegram malt flour in the ratio of 3:1:3.

**8. Title :** Development of Instant Tomato soup powder by fortification of partially hydrolyzed guar gum(PHGG) as a soluble fiber source and its characterization.

**Project Scientists :** R.B.Kshirsagar, B. A. Jadhav and N. M. Deshmukh

**Recommendation**

It is recommended that instant tomato soup powder with improved soluble dietary fiber is prepared by incorporation of 15 percent partially hydrolyzed guar gum (PHGG).

**9 Title :** Technology development of bread enriched with bitter gourd powder

**Project Scientists :** G.M. Machewad, H. W. Deshpande and P. S. Gangakhedkar

**Recommendation**

For good nutritional and sensory quality of bread, utilization of 3 per cent bitter gourd powder in its preparation and storage for five days at room temperature is recommended.

## **Research recommendations in Joint Agresco at MPKV, Rahuri 2022-2023**

**1. Title :** Development and Quality Evaluation of Low-cost Sorghum-Jaggery Based Nutribar

**Project Scientists :** Dr. S. K. Sadawarte, Dr. V.S. Pawar, Dr.G.M. Machewad, Dr. R.B. Kshirsagar, Prof. Joshi A.A. and Joshi P.T.

**Recommendation**

Use of sorghum flakes, rice flakes, peanut, sesame seeds, green gram malt, jaggery, liquid glucose and water in the proportion of 20:10:10:10:5:25:10:10 for preparation of nutri bar is recommended.

2. Title : **Studies on Formulation, Process Optimization and Quality Evaluation of Millet- Based Cookies**

Project Scientists : Kshirsagar R. B., Mane R. P., Agarkar B.S., and Patil B.M.

**Recommendation**

It is recommended that 60, 10, 15 and 15 percent refined wheat flour and germinated flour of pearl millet, finger millet and foxtail millet respectively, with incorporation of 25 percent sugar or jaggery improved the sensory and nutritional qualities of millet based cookies.

3. Title : **Studies on Development of Soup Mix Powder from Yam Blended with Drumstick Leaves and Roselle Calyces**

Project Scientists : Dr.B.S. Agarkar, R.M. Lolge, Dr.R.B. Kshirsagar and Dr. B.M.Patil

**Recommendation**

It is recommended that, good quality soup mix powder is prepared by using corn starch, yam flour, drumstick leaves powder, roselle calyces powder, dehydrated vegetables, spice mix powder and salt in 45:25:5:2:15:5:3 proportion, respectively.

4. Title : **Studies on Development of Pearl Millet Crackers Incorporated with Sorghum and Soybean Flour**

Project Scientists : K.S.Gadhe, Miss. Minal Pandit and P. U. Ghatge

**Recommendation**

For the preparation of good quality millet based nutritious crackers by using pearl millet, sorghum and soybean flour respectively in the ratio 60:30:10 is recommended.

5. Title : **Development and Quality Evaluation of Pasta by Incorporation of Cowpea Flour**

Project Scientists : P.U. Ghatge, K. S. Gadhe and P. P. Chavan

**Recommendation**

It is recommended that good quality pasta can be prepared by using wheat semolina and cowpea malt in the ratio of 80:20.

6. Title : **Studies on Exploration of the Modified Psyllium Husk in the Formulation of Probiotic Basundi**

Project Scientists : H.W. Deshpande, S.D. Katke and G.M. Machewad

**Recommendation**

It is recommended that good quality acceptable probiotic basundi can be prepared by using 0.65 percent hydrochloric acid modified psyllium husk with encapsulated culture containing equal proportions of (1:1 ratio) 10 percent of *Lactobacillus acidophilus* and *Lactobacillus bulgaricus*.

7. **Title** : **Studies on Preparation and Evaluation of *Idli* from Rice, Black Gram, Soybean, Bajra and Gums**
- Project Scientists** : G.M. Machewad, H.W. Deshpande, S.K. Sadawarte and Pathan I. U.

**Recommendation**

It is recommended that the good quality and better overall sensory acceptable *idli* can be prepared by blending 75g rice, 10g black gram dhal, 10g soybean 5g bajra and 0.5g gum and 12 hours fermentation period.

2023-24

1.	<b>Title</b>	:	Development and quality evaluation of mixed fruit bar incorporated with mahua flower
	<b>Project Scientists</b>	:	<b>Dr. V.S. Pawar</b> , Deepak Tathe and Dr.P.U. Ghatge
	<b>Recommendation</b> <p>Technology developed for preparation of VNMKV nutri mixed fruit bar with mango, papaya, mahua flower, sugar and citric acid in the proportion of 60:20:20:10:1 and storage in high impact polystyrene at room temperature (<math>37\pm 2^{\circ}\text{C}</math>) for 90 days is recommended.</p>		
2.	<b>Title</b>	:	Studies on addition of popped sorghum in wheat semolina based instant upma mix
	<b>Project Scientists</b>	:	<b>Dr. V.S. Pawar</b> and Dhadke S.G.
	<b>Recommendation</b> <p>For the preparation of VNMKV developed instant upma mix, use of sorghum pops and roasted wheat semolina of particle size <math>250\mu\text{m}</math> and fried ready spice mix in the proportion of 60:20:20 and storage in HDPE at room temperature (<math>37\pm 2^{\circ}\text{C}</math>) for 60 days is recommended.</p>		
3.	<b>Title</b>	:	Studies on preparation of halwa mix from emmer wheat (triticum dicoccum) and its quality evaluation
	<b>Project Scientists</b>	:	<b>Sadawarte S. K.</b> , Deshpande H.W., Kshirsagar R.B., Gadhe K.S., Joshi A.A., Machewad G.M. Desai G.B. and

			Suryawanshi H. V.
	<b>Recommendation</b> For the preparation of nutritious VNMKV developed 'halwa mix', semolina (50% common wheat semolina + 50% emmer wheat semolina), sugar and dry fruits in the proportion of 48:48:4 is recommended.		
4.	<b>Title</b>	:	Technology development for preparation of Karonda ( <i>Carissa carandas</i> ) beverages
	<b>Project Scientists</b>	:	<b>Anuprita A. Joshi</b> , H. W. Deshpande, R. B. Kshirsagar, S.K.Sadawarte, Thakur Preeti, Shital Chavanke
	<b>Recommendation</b> Technology developed by VNMKV Parbhani for preparation of good quality, highly acceptable nutraceuticals rich Karonda RTS beverage by using (10 % karonda pulp, 13 <sup>0</sup> Brix TSS, 0.3 % acidity), for squash (25 % Karonda pulp, 50 <sup>0</sup> Brix TSS, 1% acidity) and for syrup (25% karonda pulp, 71 <sup>0</sup> Brix TSS, 1.3% acidity) and the prepared products can be stored at refrigeration temperature for 180 days is recommended .		
5.	<b>Title</b>	:	Studies on process optimization and quality assessment of dragon fruit ( <i>Hylocereus spp.</i> ) RTS beverage blended with fruit juices
	<b>Project Scientists</b>	:	<b>Kshirsagar R. B.</b> , Agarkar B.S., Joshi A.A., Patil B.M., Syed Zubair, Lande V.K., Gaikwad G.P.
	<b>Recommendation</b> It is recommended that the technology developed by VNMKV, Parbhani for the preparation of good quality, nutritious and organoleptically accepted dragon fruit RTS beverage blended with fruit juices by using 80:20 (white flesh dragon fruit: aonla juice ) and 70:30 (Red flesh dragon fruit juice: green guava juice) and prepared RTS beverage can be stored at ambient temperature for 90 days.		
6.	<b>Title</b>	:	Standardization and development of liquid jaggery based beverage (Squash) blended with aonla juice and beetroot juice
	<b>Project Scientists</b>	:	<b>Agarkar, B. S.</b> , Kshirsagar R. B., Patil B.M., Syed Zubair, Desai G.B., Borale S. V.



	<b>Recommendation</b> <p>Technology developed by VNMKV for the preparation of good quality liquid jaggery based squash beverage and use of liquid jaggery (50%) anola juice (15%) , beet root juice (10%), tamarind juice (5%) lemon juice (5%) and ginger juice (2%) is recommended. Which has shelf life of 90 days at ambient temperature.</p>		
7.	<b>Title</b>	:	Development of processing technology for lozenges by utilizing liquid jaggery
	<b>Project Scientists</b>	:	<b>Patil B.M.,</b> Kshirsagar R.B., Syed Zubair, B.S. Agarkar, Ghongde P.K., Gaikwad G.P.
	<b>Recommendation</b> <p>It is recommended that the technology developed by VNMKV, Parbhani for preparation of good quality nutritious and organoleptically acceptable lozenges with 90% liquid jaggery, 9.8% liquid glucose, 3% basil extract, 3% mint extract and 0.2% guar gum and prepare lozenges have 90 days shelf life at room temperature.</p>		
8.	<b>Title</b>	:	Development and quality evaluation of value added Products (Popped sorghum and ambil) from Different (White, Red, yellow) Sorghum Genotypes.
	<b>Project Scientists</b>	:	<b>K.S.Gadhe,</b> K.K.Anerao, P.U. Ghatge, C.K. Bhokre, N.M. Deshmukh, G.B.Desai and R. Dhutmal
	<b>Recommendation</b> <p>It is recommended the technology developed by VNMKV for the preparation of good quality nutritious sorghum ambil, the proportion of cooked sorghum malt slurry: butter milk: spice mix (250g: 100ml:20g ) are recommended.</p>		
9	<b>Title</b>	:	Development of Technology for Preparation of Moth bean Chakali
	<b>Project Scientists</b>	:	<b>P.U. Ghatge,</b> K. S., Gadhe, V.S. Pawar, C.K. Bhokre, N.M. Deshmukh and S. R. Solanke
	<b>Recommendation</b> <p>VNMKV developed technology for the preparation of baked nutritious chakli the use of 20 % moth bean flour with 50 % pulses flour mix (40 % bengal gram: 30 % green gram: 30 % black gram) is recommended</p>		
10	<b>Title</b>	:	Studies on Development of Thermostable Gluten Free Pasta Using <i>Bacillus Coagulans</i> Spores and

			Pseudocereals
	<b>Project Scientists</b>	:	<b>H.W. Deshpande</b> , A.Poshadri, G.M. Machewad and G.B. Desai
	<b>Recommendation</b> <p>For preparation of VNMKV developed nutritious probiotic pasta, use of pseudocereals i.e. amaranth, buckwheat and quinoa in the proportion of 50:30:20 with addition of <i>Bacillus coagulans</i> (<math>7 \times 10^9</math> CFU/gm) is recommended.</p>		
<b>11</b>	<b>Title</b>	:	Studies on Preparation of Probiotic Yoghurt blended with Fruits
	<b>Project Scientists</b>	:	<b>G. M. Machewad</b> , H. W. Deshpande, G. B. Ghuge, G.B.Desai and S. K. Sadawarte
	<b>Recommendation</b> <p>It is recommended that the technology developed by VNMKV for preparation of nutritious good quality and mineral rich probiotic fruit yoghurt with incorporation of 21% fruit pulp (7% equal proportion of dragon fruit pulp, mango juice and apple pulp) in 79% yoghurt with 2% equal mixture of lactobacillus casei, lactobacillus plantarum and the prepared probiotic fruit yoghurt can stored upto 14 days at refrigerated temperature.</p>		
<b>12</b>	<b>Title</b>	:	Studies on phyto-chemical properties and processing technology of selective wild vegetables
	<b>Project Scientists</b>	:	<b>V. D. Surve</b> , Snehal Mundhe, Radha Lolge, Priyanka Kale, Thakur P.P. and Desai G.B.
	<b>Recommendation</b> <p>It is recommended that VNMKV developed the process technology for preparation of value added mathari rich in protein, fiber and minerals by using 6 % each of wild vegetables eg. <i>ghol</i> (<i>Portulaca oleracea L.</i>) and <i>chandan bathua</i> (<i>Chenopodiun album L.</i>), blanched in hot water for 3 min. with 0.5 percent sodium metabisulphite and then dried in a cabinet dryer at 60°C, 5 hours for <i>ghol</i> and 4 hours for <i>chandan bathua</i>.</p>		

**Technologies available for Commercialization at College of food Technology, VNMKV,  
Parbhani**

<b>Category</b>	<b>Name of the product</b>
<b>Karonda</b>	Karonda Mouth freshner
	Karonda Beverages-RTS, SQUASH, SYRUP
	Karonda Ice popsicals
	Karonda Pickle
<b>Aonla</b>	Aonla Candy
	Aonla beetroot squash
	Aonla Beverages
<b>Tamarind</b>	Beverages
	Sauces
	Squeezy
	Tamarind balls or chocolate
<b>Dragon Fruit</b>	Beverages- blended RTS with guava
	Ice-creams
	Dragon fruit Wines
<b>Turmeric</b>	Pickles
	Beverages
	Golden Milk
<b>Jaggery based value added products</b>	Liquid jaggery lollypop
	Liquid jaggery herbal syrup
	Liquid jaggery lozenges
<b>Millet based value added products</b>	Instant appe mix
	Finger millet cookies
	Instant upma mix
	Millet based bakery products
<b>Linseed</b>	Chikki
	Nutra laddo
	Chutney

<b>Probiotic food products</b>	Probiotic millet pasta
	Probiotic chocolate
	Probiotic fruit blended yoghurt
	Probiotic tea and coffee
	Probiotic dragon fruit juice
<b>Lemon beverages</b>	Spread
	Chunda
<b>Value Added food Products</b>	Black wheat noodles and cookies
	Moringa based energy food, tablet and powder
	Multi-vegetable khakra
	Soyagn snacks
	Fruit leather
	All Types of fruits Beverages
	Noni Fruit Beverages
	Bamboo Shoot Pickle