



P-ISSN: 2349-8528

E-ISSN: 2321-4902

IJCS 2018; 6(5): 2300-2304

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Received: 15-07-2018

Accepted: 20-08-2018

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## Pushti weaning mix to combat malnutrition among infants of 6 Months to 2 YRS

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**Abstract**

Assessment of Pushti weaning mix, as a supplementary food to combat malnutrition among infants was an aim of the study. A total of 91, Grade 2 & Grade 3 malnourished infants consisting of experimental and control group were selected from adopted villages of Krishi Vigyan Kendra, Rudrur. Pushti weaning mix was given orally in dosage of 50gms thrice a day besides breast milk. Along with breast milk, home-made mashed food was advised to control group. Infants were assessed from age of 6 months to 2 yrs in various aspects of growth and development. Infants showed improvement in all aspects of growth. Weight gained in treated group was 21 % (11% in control group).

**Keywords:** triclosan, TCS, determination, detection, sensor

**1. Introduction**

Nutritional status in children is most vulnerable during the weaning stages when both macro and micro nutrients may be insufficient to maintain growth and development. The pattern of supplementary feeding during the first year of life is increasingly recognized as important determinants of malnutrition. Malnutrition is often associated with inappropriate feeding practices occurring during the first year of life. These links between malnutrition and child feeding practices have been recognized.

Soybean is important crop grown in Nizamabad in 39313 ha which is referred as vegetarian meat due to its high quality amino acids profile. It is less expensive legume as well as oil seed due to excellence source of macronutrients and other biological properties. Hence, it is used for the formulation of high nutritious weaning and supplementary foods. Most of the studies (Deshpande *et al.* (2004) [3]) and recommended that soybean can be used as weaning and supplementary food to combat the malnutrition and to maintain good health and nutritional status in Infants.

With the intention of high significance nutritive values of soybean, soy based product such as Pushti weaning mix which contains wheat rava, soybean and jaggary is most familiar and more popular in children diet. With this in view the present study was undertaken with the following objective.

**2. Objective of the study:** To assess the Pushti weaning mix prepared by Krishi Vigyan Kendra, Rudrur as supplementary food among malnourished infants.

**3. Methodology****Selection of Infants**

Krishi Vigyan Kendra, Rudrur conducted Participatory Rural Appraisal (PRA) in adopted villages in 2011-12. During PRA severe malnourished vulnerable groups viz Infants, Pre-school children, Adolescents and Pregnant women were identified. According to the mandate of KVK, based on the identified problem, the Home scientist formulated On Farm Testing (OFT) during 2012-13 entitled Assessment of Supplementary food among Infants with three treatments viz normal practice (T<sub>1</sub>) consuming java or milk, standardized supplementary food like Pushti weaning mix as T<sub>2</sub> and supplementary food with locally available material as T<sub>3</sub>. Standardized supplementary food i.e Pushti weaning mix was taken from All India Co-ordinated Research Project, Food & Nutrition Department, PG&RC, Rajendranagar, Hyderabad as it was technologically feasible and economically profitable which moved to Front Line Demonstration (FLD) and got popularized.

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A total of 91 malnourished infants whose weights fell under grade 2 & grade 3 in growth chart were taken for OFTs & FLDs from the Anganwadi centers of KVK adopted villages viz., Rampur, Sankora, Laxmapur, Mirzapur, Kistapur, Birkur, Thimmapur and Chincholi.

**Sources of data:** The inclusion and exclusion criteria were followed for the selection of Infants between the age group of 6 to 2 yrs.

**Inclusion criteria:** Infants between the age group of 6 to 2 yrs under grade 2 & grade 3 category were included in the study.

**Exclusion criteria:** Infants having malnourished disorders like Protein Energy malnutrition and Marasmus and Infants of pre mature birth were selected.

**Research design:** Exploratory research design was adopted.

**Assessment criteria:** Infants included in the study were assessed before, during and after the study and the following growth and development parameters were recorded.

**Observations:** At the age of 1 yr, Infant was unable to stand properly, 6-12 months age infants with low weight and not taking any food properly. Some infants are facing severe health problems frequently.

**Table 1:** Nutritive Values of Pushti weaning mix

Ingredients required to prepare 1 kg Pushti	Per day requirement of Pushti per child in grams	Nutrients in 100 gms Pushti
	150 gms pushti in 3 meals	Calories -363
Roasted wheat ravva (667 gms)	Wheat ravva -100 gms	Protein -18.1 gms
Roasted soyabean dal(167 gms)	Soyabean dal -25 gms	Iron – 6.3 mg
Jaggary (166 gms)	Jaggary -25 gms @ 50gms per meal	Kerotin - 136

**Mode of administration of Pushti weaning mix**





**Experimental group:** Pushti weaning mix was given 50 gm thrice a day. Pushti weaning mix was mixed with water and boiled for 20 minutes till it attains semi-solid consistency and later added with milk or ghee to make it energy dense. Along with this, breast milk feeding was advised to continue.

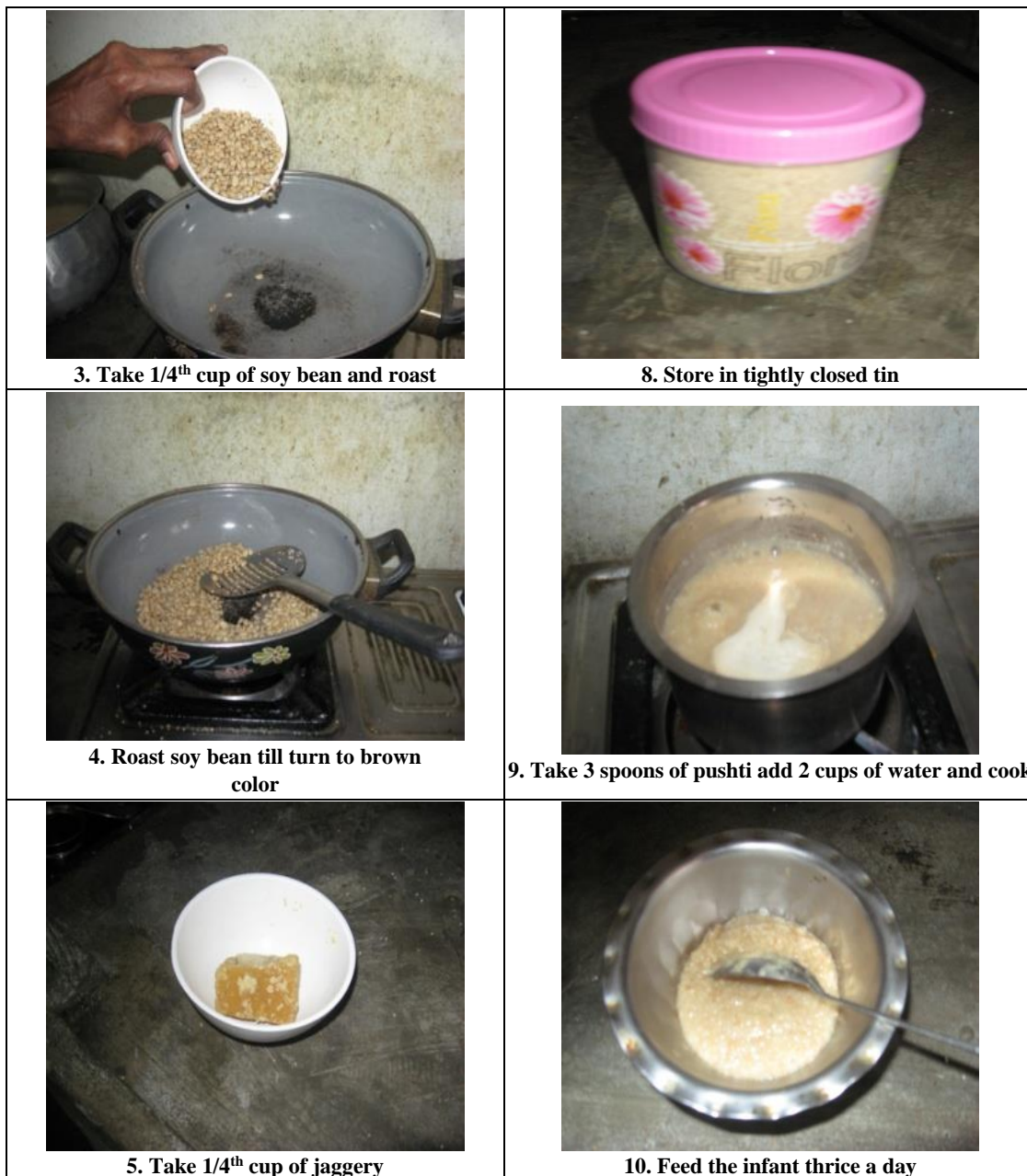
**Control group:** Along with breast milk, Balamrutham or home-made mashed food was advised.

**Follow up study:** After completion of 4 months the children growth chart was prepared and also got the feedback from the mothers about weaning mix nutritive values.

**Method of preparation**

**Table 2:** Preparation of Pushti weaning mix

 <p><b>1. Take 1 cup of wheat rava and roast</b></p>	 <p><b>6. Roasted Wheat Rava + Roasted Soy Bean + Jaggery = Pushti</b></p>
 <p><b>2. Roast the wheat rava till turns to white color</b></p>	 <p><b>7. Grind roasted wheat rava, soy bean and jiggery</b></p>



3. Take 1/4<sup>th</sup> cup of soy bean and roast

8. Store in tightly closed tin

4. Roast soy bean till turn to brown color

9. Take 3 spoons of pushti add 2 cups of water and cook

5. Take 1/4<sup>th</sup> cup of jaggery

10. Feed the infant thrice a day

**4. Results and Discussion**

**Age and sex of the surveyed children**

**Table 3:** Age and sex distribution of infants (n=91)

S. No	Age (Months)	2012-13			2013-14			2014-15			2015-16			Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
1.	6-12	4 (4.39)	8 (8.79)	12 (13.18)	3 (3.29)	11 (12.08)	14 (15.38)	3 (3.29)	5 (5.49)	8 (8.79)	2 (2.19)	5 (5.49)	7 (7.69)	12 (13.18)	29 (31.86)	41 (45.05)
2.	13-18	3 (3.29)	5 (5.49)	8 (8.79)	2 (2.19)	7 (7.69)	9 (9.89)	1 (1.09)	4 (4.39)	5 (5.49)	2 (2.19)	4 (4.39)	6 (6.59)	8 (8.79)	20 (21.97)	28 (30.76)
3.	19-24	0 (0.00)	1 (1.09)	1 (1.09)	1 (1.09)	6 (6.59)	7 (7.69)	4 (4.39)	3 (3.29)	7 (7.69)	1 (1.09)	6 (6.59)	7 (7.69)	6 (6.59)	16 (17.58)	22 (24.17)
Total		7 (7.69)	14 (15.38)	21 (23.07)	6 (6.59)	24 (26.37)	30 (32.96)	8 (8.79)	12 (13.18)	20 (21.97)	5 (5.49)	15 (16.48)	20 (21.97)	26 (28.57)	65 (71.42)	91 (100.00)

The age and sex of the infants are viewed with more importance to know the nutritional status of a community as they are considered most vulnerable groups of the society. The distribution of selected Infants (6 months to 2 yrs) according to their age and sex is shown in Table 2.

It is observed from Table 2 that out of 91 selected Infants, 26 (28.57%) were male and 65 (71.42%) female. It was seen that maximum infants belonged to the age group of 6 to 12 months i.e 45.05 percent out of which 13.18 percent male and 31.86 percent female followed by 13-18 months i.e 30.76 percent followed by 19-24 months i.e 24.17 percent. It was also

observed that during the year 2012-13 out of 21 infants 15.38 percent were female and 7.69 percent male were selected. In the year 2013-14 out of 30 infants 24 (26.37%) female and 6 (6.59%) male were selected. Fifteen point three eight percent infants belonged to 6 to 12 months age group. During the year 2014-15 & 2015-16 20 infants each were selected in that 12

(13.18%) female and 8 (8.79%) male followed by 15 (16.48%) female and 5 (5.49%) respectively.

## Weights of Infants

**Table 4:** Paired t-test in pushti weaning mix infants weights

Year	Pre- Test weights Mean	Post Test weights mean	Mean difference	SD	SE	T value	P value
2012-13	6.729	8.829	2.1	0.34	0.22	9.57	0.05
2013-14	6.91	8.374	1.46	0.73	0.27	5.43	0.05
2014-15	7.905	9.582	1.68	0.46	0.21	7.86	0.05
2015-16	7.41	9.19	1.78	0.34	0.18	9.66	0.05

During the year 2012-13, the initial mean weight of the infants in experimental group before supplementation of pushti weaning mix was 6.729 kgs. After completion of intervention the mean weight was 8.829 kgs. There was 31% improvement within the experimental group at P value < 0.05 on applying the paired 't' test within the group. In the year 2013-14 pretest weights of infants in the experimental group before starting the weaning food was 6.91kg. After completion of intervention the mean weight was 8.374 kg. There was 21% improvement within the experimental group

at P value 0.05 on applying the paired't'- test within the group. Before starting the pushti weaning supplementation mean pretest weights of infants was 7.905 kg and post test weight was 9.582kgs in the year 2014-15. Pretest weight of infants in the experimental group during the year 2015-16 was 7.41 kg. After completion of 4 months posttest weight of infants was 9.19kg. There was 24% improvement within the experimental group at P value 0.05 on applying the paired't'- test within the group.

**Table 5:** Paired t-test in Normal weaning mix infants weights

Year	Pre- Test weights Mean	Post Test weights mean	Mean difference	SD	SE	T value	P value
2012-13	6.443	7.329	0.89	0.02	0.06	16.008	0.05
2013-14	7.86	7.915	0.06	0.09	0.10	0.568	0.05
2014-15	8.175	8.604	0.43	0.07	0.08	5.12	0.05
2015-16	7.3	7.83	0.53	0.15	0.12	4.26	0.05

During the year 2012-13 pre test weight of infants in the control group was 6.443 kg. After completion of 4 months mean posttest weight of infants was 7.329 kg. There was 14 % improvement within the control group at P value 0.05 on applying the paired't'- test. With respect to weight of infants, there was no significant improvement in the control group at P value 0.05 on applying the paired't'- test within the group during the year 2013-14 as the pretest weight was 7.86 kg and posttest weight was 7.915 respectively. During the year 2014-15 the initial mean weight of infants in the control group was

8.175kg. After completion of intervention Posttest weight was 8.604kg. There was meager percentage (5%) improvement was observed among infants in the control group at P value 0.05 on applying the paired't'- test within the group. With regard to weight of infants in control group during the year 2015-16 mean pretest weight was 7.3 kg and posttest weight was 7.83kgs. There was meager (7%) percentage improvement was observed at P value 0.05 on applying the paired 't'- test within the group.

**Table 6:** Unpaired t-test in both weaning mix in fants weights

Year	Experimental group Mean	Control group mean	SE Mean difference	T value	P value	P value
2012-13	8.83	7.33	1.93	-2.0196	0.033	>0.05
2013-14	8.37	7.92	0.51	-1.44	0.083	>0.05
2014-15	9.58	8.6	1.74	-1.65	0.0573	>0.05
2015-16	9.18	7.83	1.46	-2.511	0.0109	>0.05

On applying unpaired 't' test between the pushti weaning mix and normal weaning mix, the results showed that though P value was >0.05 but comparing the mean weight of both groups – experimental group 8.83 kg and control group 7.33 kg respectively in the year 2012-13 shows that weight gain in the study group was increased with that of control group. During the year 2013-14 and 2015-16 mean weights of both experimental and control group are not significant at the t value. In the year 2014-15 P value was >0.05 comparing the mean weight of both groups- experimental group 9.58 kgs and control group 8.6 kgs.

## 5. Conclusion

Pushti weaning mix prepared by Krishi Vigyan Kendra, Rudrur as supplementary food for malnourished infants was analyzed by quality control lab, PJTSAU, Rajendranagar, Hyderabad for Nutritive values. The report indicated the good amount of nutritive values like moisture-9.42, ash-1.65, fat-0.09, fiber-1.70 and protein content 13.58 gm. Based on the

nutritive values in the Pushti weaning mix and the developments observed among infant viz Good physical development: increased body weigh; Cognitive development: identification of objects; Psycho motor skill development: doing small activity and playing games and Social development: mingling with others by actively calling, the Krishi Vigyan Kendra started motivating the farm women to start micro entrepreneurship on preparing and selling pushti weaning mix.

## Success story documented on Pushti weaning mix Pushti a secret of Shakti

A needy woman once upon a time, owns the small entrepreneurship now for selling Pushti weaning mix earning Rs.5000/- per month.

This is the success story of Smt. K. Padma, mother of infant beneficiary of Pushti weaning mix from Kistapur village, Birkur Mandal, Nizamabad district. Pushti weaning mix is a supplementary food consisting roasted wheat ravva, roasted

soya dal and jaggery with following nutritive values and child health benefits.

S. No.	Nutritive values in 100 gms of Pushti
1.	Calories- 363
2.	Protein - 18.1g
3.	Iron - 6.3 mg
4.	Carotene – 136

S. No.	Child Health benefits
1	Good physical development
2	Cognitive development
3	Psycho motor skill development
4	Social development



Distributing Pushti at Anganwadi center



Pushti Weaning mix

The Home Scientist conducted 3 On Farm Trials during 2011-14 in KVK adopted villages which has gone to Front Line Demonstration during 2014-15 that improved the health of the infant child significantly after four months of feeding in terms of gaining body weight of 1.25 kgs compared to child fed with normal weaning mix.

The economics of Pushti weaning mix					During 2015-16	
Required Ingre-dients	Cost per kg	For 1 kg pushti preparation required quantity	Cost of each product for 1 kg pushti	Invested Rupees for the preparation of 5 kgs pushti	Initial earnings during March 2014 With 5 kg Pushti @ 40/- per 100 gms pkt	Increased earnings by March, 2016 by selling 10 kgs
Wheat rava	Rs 55/-	667 gms	Rs 37/-	Rs. 185/-	50 pkt x40/- = Rs. 2000/- Packing & other charges = Rs.100/-	Due to the demand of the product she has increase the cost of packet from Rs.40 to Rs.60/- 100 pkt x 60/- = 6000/- Packing & other charges = Rs.200/- Gains = Rs. 6000 – 710 + 200 = 5190/- *within 2 yrs she could gain the difference of Rs.3,645/-
Soya dal	Rs 140/-	166 gms	Rs 23/-	Rs. 115/-		
Jaggery	Rs 65/-	167gms	Rs 11/-	Rs. 55/-		
Total:			Rs. 71/-	Rs. 355/-	Gains = Rs. 2000 – 355 + 100= Rs.1,545/-	

The child health benefits of the Pushti on her own son and other neighbouring infant beneficiaries motivated Padma positively and drove her to start her own selling unit of Pushti at her residence with no extra infrastructure.



Smt. K. Padma, mother of Infant beneficiary of Pushti weaning mix



At present Durga Prasad

Beginning with selling of 5 kgs of Pushti weaning mix in 100gms packet @ 40/- each she has now rose to the occasion to earn income of Rs.5190/- per month by selling 10 kg pushti and she quotes *Pushti - A Secret Of Shakti*.

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