5. SUMMARY AND CONCLUSIONS

Under nutrition is one of the major problems confronting infants and young children in developing countries. Infancy is considered to be the critical period during which there is high incidence of mortality and morbidity. The main reason for infant malnutrition is prolonging breast feeding without an appropriate and timely introduction of complementary foods. Supplementary feeding has to be adopted to maintain the needs for growth of infants and to bridge the gap of energy and protein requirement. The vulnerable segment of population suffering from malnutrition do not have access to expensive protein concentrates. So, this problem can be solved through the use of inexpensive local foods available easily.

So, the present study entitled, “Quality evaluation of weaning foods prepared from locally available agricultural produce”, was undertaken as a thesis research work to develop nutritious, easy to prepare and cost effective instant weaning foods from locally available agricultural produce with the following objectives:

1. To develop weaning foods from locally available raw food materials and using traditional processing methods.

2. To study storage stability of the developed weaning foods.

3. To study the economics of the prepared weaning foods.

- The grains of rice, wheat, maize, Bengal gram and green gram and other ingredients as groundnut and sesame were procured from farmers and local market.

- Different processing techniques were used for different produces. Roasting at $120^\circ$C for 20 minutes for 500 g raw material was used for wheat, maize, Bengal gram, red gram, groundnuts and sesame. Malting was done by doing germination for 2-3 days and then drying for wheat, maize and green gram. Fermentation process was used for milled maize flour dough and then it was dried. Boiling/pressure cooking for 35-40 minutes was used for rice, wheat, Bengal gram and green gram dhal and then it was dried.
• All the grains, groundnuts and sesame after processing were ground into flour and sieved.

• Different prepared ingredients were mixed in standardized proportions to develop different weaning foods.

• The developed weaning foods were analysed for organoleptic scores, proximate parameters, nutritional parameters, energy content, in vitro protein digestibility, microbiological parameters and cost effectiveness.

• The score for colour, consistency and flavour was highest for W10 (upma with soy grits) whereas score for taste was maximum (7.66) for W7 (salted dalia with soy grits) in the weaning foods prepared from wheat in roasted form.

• The weaning foods prepared from cooked rice with roasted Bengal gram and other ingredients scored better for all organoleptic parameters. The organoleptic scores were high in the weaning foods prepared from roasted maize as an ingredient. The storage period had non-significant effect on all the organoleptic parameters in all the three types of weaning foods.

• Malting of maize and roasting and malting of wheat increased the ash content. Malting increased fat content in maize based weaning food. In the wheat based weaning foods crude fibre was maximum for broken wheat (dalia) and the least value was for semolina based food. In the rice based weaning foods fibre was more in khichri samples where cooked dhal was used. In maize malted foods, fibre content was highest as compared to other maize based weaning foods.

• The highest value for true protein was observed in M5 (17.56%) where maize was used in combination of malting and fermentation. Among the different groups highest value was for maize based weaning food (17.56%) followed by rice based weaning food (15.21%) and wheat based weaning food (13.17%).

• Calcium content was high in wheat based weaning food W1(91.31 mg/100g) followed by R5 (60.52 mg/100g) and M4 (74.39 mg/100g)

• Malting of wheat increased the iron content in W1 (5.14 mg/100g) followed by R5 (3.84 mg/100g) and M4 (3.71 mg/100g)
• Carbohydrate content was highest for R1 (66.01 g/100g) prepared from cooked rice+ roasted Bengal gram+ roasted groundnut) followed by W4 (63.41 g/100g) malted wheat+ cooked Bengal gram+ roasted groundnut and M5 (62.02 g/100g).

• In the maize based weaning foods highest value was for M4 (344.32 kcal) in which maize malt+ fermented maize was used. In the rice based weaning foods R2 had the highest value (314.35 kcal) in which roasted Bengal gram was used. In the wheat based weaning foods W4 prepared from wheat malt had highest value (342.64 kcal).

• In vitro protein digestibility was highest for M5 (72.20 %) which was prepared from fermented maize+ cooked Bengal gram, W1 (61.22%) and R5 (52.28%) followed it which were prepared by malted wheat+ roasted Bengal gram+ roasted groundnuts and cooked rice+ roasted groundnut+ roasted sesame, respectively. The highest in vitro protein digestibility was observed in the three weaning foods using Bengal gram in roasted form.

• Microbiological results indicated colony forming unit in the range of 9×10^2 to 22×10^2 after 90 days storage period which is in the safe limit which indicates good shelf life for the prepared weaning foods.

• The cost of the prepared weaning foods ranged between Rs. 62.00 to 85.25 per kg which is much less than Rs. 140 per 500g of commercial brands available in market.

The study concludes that the locally available agricultural produce can be used for the preparation of nutrient dense weaning foods after processing with techniques like roasting, malting, cooking and fermentation. Further, the addition of jaggery increased the energy value of the weaning foods.


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# Evaluation card for Hedonic rating test for food products

Name............................................                                                               Date……………………

Product........................................

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<th>Sample Code</th>
<th>Colour</th>
<th>Taste</th>
<th>Flavour</th>
<th>Consistency/ Texture</th>
<th>Overall Acceptability</th>
<th>Remarks, if any</th>
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Signature………………

Like Extremely - 9
Like Very Much - 8
Like Moderately - 7
Like Slightly - 6
Neither Like Nor Dislike - 5
Dislike Slightly - 4
Dislike Moderately - 3
Dislike Very Much - 2
Dislike Extremely - 1
Appendix II

Standard Curve of D-Glucose

OD at 630nm

Concentration (mg)
## Appendix- III

Chemical composition of tryptone glucose extract agar

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<th>Component</th>
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<tr>
<td>Glucose</td>
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<tr>
<td>Agar</td>
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<td>Final pH (25°C)</td>
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## Appendix- IV

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<th>Ingredients</th>
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<tr>
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<td>Bengal gram</td>
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<td>Red gram</td>
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<tr>
<td>Soy grits</td>
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<td>Sesame seeds</td>
<td>Rs. 80 per kg</td>
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<tr>
<td>Groundnuts</td>
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<tr>
<td>Vegetable oil</td>
<td>Rs. 140 per kg</td>
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</tbody>
</table>
Brief Biodata of student

Name : Archana Thakur
Father’s name : Sh. Rajpal Singh
Mother’s name : Smt. Promila Devi
Date of Birth : 6th September 1991
Permanent Address : d/o Sh. Rajpal Singh, House No.9, Staff Quarters, Near Mandi House, New Delhi- 110001

Academic Qualifications:

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<th>Board/University</th>
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<tr>
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<td>Lady Irwin College</td>
<td>Delhi University</td>
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