Innovative products using amrutham nutrimix and its popularization among young mothers

Subhashree S, Jisha A Prabha, Reegan Thomas, Harisuthammal VN

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Abstract

Under nutrition in children is a widespread health problem in our country. ICDS that addresses the problem of malnutrition has been unsuccessful even after three decades of implementation. Amrutham nutrimix - a nutritious supplementary food given for malnourished children is not utilized due to monotony in its preparation. Hence an attempt was made to formulate nutritious amrutham based recipes. Twenty common recipes including sweet dishes and savories were prepared. Acceptability of all the developed products was assessed by a taste panel. Iron and protein content was analysed for the 6 most accepted products. All the formulated products were affordable and ranged from 50p (murukku) to Rs.3/- (sweet balls) per 100g. The recipes were displayed and popularized among young mothers as they are the prime caregivers of young toddlers and are willing to change food behavior for the welfare of their children. Recipes and its health benefits were discussed with the participants. The education program was very effective in imparting nutrition knowledge as there was significance in the pre and post test scores. Hence, amrutham nutrimix can be an affordable and acceptable nutritional substitute to WHO recommended ready to use therapeutic food (RUTF) for Severe Acute Malnutrition (SAM) especially when used in diverse forms as suggested in the current study.

Keywords: Amrutham nutrimix, Malnutrition, SAM, RUTF

Introduction

Hunger is a global measure of food deprivation, while malnutrition is the physiological outcome of hunger. According to the National Family Health Survey 3 conducted in 2005-2006, 48% of the children under 5 years were chronically malnourished (indicating long term food deprivation) and 43% underweight. In the state of Kerala in India, one-quarter of the children under age five were stunted, 16% wasted and 23 % were underweight (NFHS-3, 2008). The recent global hunger index also seems unpromising as India ranks 55 among 76 countries and the situation is described to be ‘serious’ (Grebmer et al, 2014). Malnutrition, influenced by economic (rising food prices), social (food taboos), environmental (poor sanitation/hygiene) and individual (inadequate food intake) factors is an important concern in children under 6 years. Providing special nutrition support can prevent causing irreversible damages that affect their future potential. The ICDS (Integrated Child Development Services) is a flagship welfare program of the Government of India that focuses primarily on early childhood development. In an effort to bridge the gap between the recommended calorie allowance and the average calorie intake of children, nutritional supplements and some food based nutrimixes are distributed to low income families. Currently, about 916 lakh people are receiving nutritional supplement through the ICDS (http://wcd.nic.in/ics.htm). Locally produced foods are culturally acceptable and have been successful in managing malnutrition in India for many decades (Prasad et al 2009). This was also supported by Dube et al, (2009) who compared the acceptability and energy intake of ready to use therapeutic foods (RUTF) and a cereal pulse based home preparation and reported that the home preparation had better acceptability.

Amrutham is one such supplement that is nutritious, ready to cook and distributed free of cost as a take home ration through anganwadi centres. The supplement consisting of wheat (45%), soyabean (6%), bengalgram (10%), groundnut (10%) and jaggery (25%) (http://www.ruralhealthgoa2012.org) is often prepared as porridges. However this is unappealing to children due to monotony in taste and unattractive appearance. It is not properly consumed, often wasted and used as poultry feed.

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Making innovative preparations with amrutham nutrimix could pave the way for its better use in future to overcome the problem of malnutrition. Hence the use of locally prepared health mixes like amrutham nutrimix as supplementary food will be an affordable, long-term solution to tackle the problem of undernutrition when compared to the WHO’s (World Health Organization) RUTF that are both unaffordable and suited only for short-term use.

Hence an effort was made in this study to formulate nutritious amrutham based recipes and popularize it among young mothers to ensure its efficient use in children.

Materials and Methods

Preparations using amrutham nutrimix

In the present study, 20 common preparations were chosen. In all preparations, the multigrain amrutham powder was added as a substitute instead of the usually used single grain flours. The recipes were chosen based on the participants’ familiarity with the recipes and availability of ingredients (Recipes available as supplementary file).

Amruth nutrimix preparations:

1. Amruth Kheer – A dessert made with coconut milk and nutrimix
2. Veg Roll - Fried mixed veggies and nutrimix roll
3. Kinnathappam – Coconut milk, sugar and nutrimix steamed cakes
4. Ela Ada - Nutrimix spread on banana leaf with a filling of coconut and jaggery
5. Kumbilappam – A mix of amrutham powder, coconut and jaggery wrapped in fresh bay leaf and steamed
6. Murrukkan – A South Indian savory crunchy wheels made with nutrimix and curd and sesame seeds
7. Kozhukkaattai – Nutrimix dumpling with coconut and jaggery filling
8. Upma – A mild flavoured tiffin cooked as a thick porridge using nutrimix and mild seasonings
9. Halwa - Jaggery based sweet Indian dessert
10. Steam Cake – Colourful stacks of powdery nutrimix interlaced with layers of coconut and vegetables
11. Sweet Pidi – Nutrimix balls on thick sugar sweetened porridge
12. Onion Vada – Doughnut shaped deep fried snack with nutrimix and onion
13. Vattayappam – Fermented and steamed dish made with nutrimix and sugar
14. Iddiyappam – Nutrimix based steamed noodles topped with fresh coconuts
15. Sweet balls – Sweet balls with nutrimix, coconut and jaggery
16. Pakkavadas- Crispy fried ribbons made with nutrimix
17. Idli – A staple fermented South Indian breakfast with nutrimix and fried groundnuts
18. Chocolate shake – A nutrimix based chocolate flavoured milkshake
19. Ela Ada - Nutrimix spread on banana leaf with a filling of coconut and jaggery
20. Special Cake- Nutrimix based cake baked with raisins

Selection of panel members

All preparations were standardized in the laboratory. The standardized recipes were subjected to sensory evaluation by panel members that included young mothers. Though the products were intended for young children, they are not capable of scientific evaluation of the products. Hence, their mothers who are the primary care givers and are aware of the likes and dislikes of their children were chosen as panel members. The study was conducted in a semi urban anganwadi centre located in Kottayam District, Kerala, India. Among the 22 young mothers whose children attended the anganwadi centre, 10 were selected as panel members on the basis of their ability to differentiate between samples identified using the triangle test. Willingness of the subjects to participate in the taste panel was obtained. The mothers were in the age of 21 - 35 yrs and all belonged to the low socio economic strata.

Sensory evaluation

A well designed score card was used to score all the products. The panel members were asked to evaluate the products on a five point scale for attributes like appearance, colour, texture, flavor and taste. The total scores of the products were calculated and the best six were identified by ANOVA.

Chemical analysis and Nutrient calculation of the selected preparations

Nutritive value of the products for calories, protein, fat, carbohydrate, β-carotene, iron and calcium was computed using ICMR values (Gopalan et al, 2002). The protein and iron content of the best six products alone were analyzed using standard colorimetric procedures. Nutrient content of the nutrimix was taken from the nutritional information provided in the label. The cost of the products was also calculated to know its affordability.

Popularization of the products through nutrition education

Mothers are always willing to change food behaviors for the welfare of their children. Hence the selected recipes were popularized among young mothers whose children attended the anganwadi centre. Nutrition education program was conducted to provide awareness about amrutham nutrimix as an important supplementary feed. All the dishes were displayed and method of preparation was explained to them in order to encourage its use in different preparations. Pre and post tests were done using a questionnaire that helped to assess their knowledge regarding supplementary feeds, amrutham nutrimix and its benefits. The impact of the education program was statistically analyzed by t-test.

Results and Discussion

Organoleptic qualities of the developed products

When the quality of food product is assessed by means of human sensory organs, the evaluation is said to be sensory or organoleptic. Sensory quality is a combination of different senses of perception coming into play in choosing and eating a food. Appearance, flavor and mouth feel decide the acceptance of the food (Srilakshmi, 2012).

Good appearance is an important pre-requisite of food acceptance. Among the twenty preparations, vegetable roll, mixture and pakkavada had the highest scores (4.96) for appearance. Vegetable roll was the most preferred dish with highest scores for colour (5.00), flavor (5.00), texture (4.93) and taste (5.00). The six best products selected by ANOVA were vegetable roll (4.97), mixture (4.9), onion vada (4.89), amruth kheer (4.87), ela ada (4.85) and sweet balls (4.82). The developed products obtained higher mean scores than the scores obtained for plain amrutham mix (3.8 out of 5.76% acceptability) as reported by Central Plantations Crop Research Institute (CPCRI), Kerala (http://www.ruralhealthgoa 2012.org).
Table I shows the results of sensory evaluation of the developed products.

Table 1: Mean scores of sensory evaluation

<table>
<thead>
<tr>
<th>Dishes</th>
<th>A</th>
<th>C</th>
<th>T</th>
<th>F</th>
<th>Taste</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sweet balls</td>
<td>4.76</td>
<td>4.7</td>
<td>4.83</td>
<td>4.86</td>
<td>4.96</td>
<td>4.82</td>
</tr>
<tr>
<td>Vegetable Roll</td>
<td>4.96</td>
<td>5</td>
<td>4.93</td>
<td>5</td>
<td>4.97</td>
<td></td>
</tr>
<tr>
<td>Ela Ada</td>
<td>4.83</td>
<td>4.86</td>
<td>4.86</td>
<td>4.8</td>
<td>4.9</td>
<td>4.93</td>
</tr>
<tr>
<td>Vattayappam</td>
<td>4.33</td>
<td>4.35</td>
<td>4.66</td>
<td>4.5</td>
<td>4.47</td>
<td></td>
</tr>
<tr>
<td>Kinnathappam</td>
<td>4.43</td>
<td>4.46</td>
<td>4.5</td>
<td>4.5</td>
<td>4.5</td>
<td></td>
</tr>
<tr>
<td>Kumbilappam</td>
<td>4.76</td>
<td>4.7</td>
<td>4.56</td>
<td>4.59</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Murukku</td>
<td>4.83</td>
<td>4.83</td>
<td>4.76</td>
<td>4.83</td>
<td>4.78</td>
<td></td>
</tr>
<tr>
<td>Mixture</td>
<td>4.96</td>
<td>4.96</td>
<td>4.83</td>
<td>4.93</td>
<td>4.9</td>
<td></td>
</tr>
<tr>
<td>Pakkavada</td>
<td>4.96</td>
<td>4.96</td>
<td>4.76</td>
<td>4.76</td>
<td>4.84</td>
<td></td>
</tr>
<tr>
<td>Kozhu kattai</td>
<td>4.4</td>
<td>4.44</td>
<td>4.43</td>
<td>4.56</td>
<td>4.45</td>
<td></td>
</tr>
<tr>
<td>Sweet idli</td>
<td>4.26</td>
<td>4.36</td>
<td>4.13</td>
<td>4.3</td>
<td>4.25</td>
<td></td>
</tr>
<tr>
<td>Steam Cake</td>
<td>4.76</td>
<td>4.86</td>
<td>4.76</td>
<td>4.56</td>
<td>4.68</td>
<td></td>
</tr>
<tr>
<td>Upma</td>
<td>4.7</td>
<td>4.73</td>
<td>4.83</td>
<td>4.83</td>
<td>4.78</td>
<td></td>
</tr>
<tr>
<td>Onion Vada</td>
<td>4.93</td>
<td>4.96</td>
<td>4.76</td>
<td>4.93</td>
<td>4.89</td>
<td></td>
</tr>
<tr>
<td>Amruth Kheer</td>
<td>4.93</td>
<td>4.9</td>
<td>4.83</td>
<td>4.93</td>
<td>4.87</td>
<td></td>
</tr>
<tr>
<td>Idiyappam</td>
<td>4.53</td>
<td>4.53</td>
<td>4.43</td>
<td>4.33</td>
<td>4.43</td>
<td></td>
</tr>
<tr>
<td>Chocolate shake</td>
<td>4.65</td>
<td>4.7</td>
<td>4.76</td>
<td>4.7</td>
<td>4.66</td>
<td></td>
</tr>
<tr>
<td>Special Cake</td>
<td>4.86</td>
<td>4.86</td>
<td>4.43</td>
<td>4.43</td>
<td>4.61</td>
<td></td>
</tr>
<tr>
<td>Special halwa</td>
<td>4.83</td>
<td>4.87</td>
<td>4.77</td>
<td>4.47</td>
<td>4.73</td>
<td></td>
</tr>
<tr>
<td>Sweet Pidi</td>
<td>4.53</td>
<td>4.53</td>
<td>4.43</td>
<td>4.43</td>
<td>4.44</td>
<td></td>
</tr>
</tbody>
</table>

A: Appearance; C: Colour; T: Texture; F: Flavor;

Table 2: Nutrient content of selected preparations

<table>
<thead>
<tr>
<th>Dishes</th>
<th>Energy (kcal/100g)</th>
<th>Protein (g/100g)</th>
<th>Fat (g/100g)</th>
<th>CHO (g/100g)</th>
<th>Calcium (mg/100gm)</th>
<th>Iron (mg/100g)</th>
<th>B-carotene (µg/100g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vegetable Roll</td>
<td>383</td>
<td>13.32*</td>
<td>3.30</td>
<td>47.05</td>
<td>126.99</td>
<td>2.83*</td>
<td>402.5</td>
</tr>
<tr>
<td>Onion Vada</td>
<td>400</td>
<td>13.85*</td>
<td>3.27</td>
<td>45.26</td>
<td>133.30</td>
<td>4.20*</td>
<td>202.8</td>
</tr>
<tr>
<td>Ela Ada</td>
<td>398</td>
<td>15.00*</td>
<td>10.5</td>
<td>63.8</td>
<td>147.3</td>
<td>4.16*</td>
<td>236.6</td>
</tr>
<tr>
<td>Mixture</td>
<td>503</td>
<td>23.58*</td>
<td>7.99</td>
<td>63.90</td>
<td>179.18</td>
<td>7.82*</td>
<td>307.9</td>
</tr>
<tr>
<td>Ladoo</td>
<td>376</td>
<td>24.83*</td>
<td>9.52</td>
<td>66.74</td>
<td>136.2</td>
<td>4.16*</td>
<td>202.8</td>
</tr>
<tr>
<td>Amruth Kheer</td>
<td>310</td>
<td>26.23*</td>
<td>22.13</td>
<td>46.15</td>
<td>67.2</td>
<td>3.5*</td>
<td>98.4</td>
</tr>
<tr>
<td>Vattayappam</td>
<td>405.8</td>
<td>22.1</td>
<td>11.5</td>
<td>63.44</td>
<td>119.1</td>
<td>5.59</td>
<td>202.8</td>
</tr>
<tr>
<td>Kinnathappam</td>
<td>403.1</td>
<td>25.57</td>
<td>10.04</td>
<td>64.45</td>
<td>137.1</td>
<td>6.5</td>
<td>236.6</td>
</tr>
<tr>
<td>Kumbilappam</td>
<td>313</td>
<td>18.69</td>
<td>6.88</td>
<td>52.98</td>
<td>109.72</td>
<td>5.02</td>
<td>192.4</td>
</tr>
<tr>
<td>Murukku</td>
<td>395</td>
<td>35.68</td>
<td>5.44</td>
<td>68.04</td>
<td>191.23</td>
<td>8.9</td>
<td>338</td>
</tr>
<tr>
<td>Pakkavada</td>
<td>395</td>
<td>35.68</td>
<td>5.44</td>
<td>68.04</td>
<td>191.23</td>
<td>8.9</td>
<td>338</td>
</tr>
<tr>
<td>Kozhu kattai</td>
<td>402.4</td>
<td>22.39</td>
<td>11.59</td>
<td>62.42</td>
<td>132.74</td>
<td>5.9</td>
<td>202.8</td>
</tr>
<tr>
<td>Sweet idli</td>
<td>395</td>
<td>35.68</td>
<td>5.44</td>
<td>68.04</td>
<td>191.23</td>
<td>8.9</td>
<td>338</td>
</tr>
<tr>
<td>Steam cake</td>
<td>264.95</td>
<td>15.96</td>
<td>10.55</td>
<td>33.33</td>
<td>132.94</td>
<td>4.64</td>
<td>970.7</td>
</tr>
<tr>
<td>Upma</td>
<td>356.9</td>
<td>19.65</td>
<td>11.17</td>
<td>41.68</td>
<td>112.7</td>
<td>5.21</td>
<td>353</td>
</tr>
<tr>
<td>Idiyappam</td>
<td>370.1</td>
<td>25.89</td>
<td>12.14</td>
<td>51.26</td>
<td>143.8</td>
<td>6.67</td>
<td>425.6</td>
</tr>
<tr>
<td>Chocolate shake</td>
<td>36.6</td>
<td>10.81</td>
<td>3.68</td>
<td>42.4</td>
<td>119.7</td>
<td>2.79</td>
<td>124.5</td>
</tr>
<tr>
<td>Special cake</td>
<td>409.4</td>
<td>29.14</td>
<td>5.44</td>
<td>83.08</td>
<td>179.3</td>
<td>7.19</td>
<td>272.9</td>
</tr>
<tr>
<td>Special halwa</td>
<td>313.3</td>
<td>11.75</td>
<td>12.83</td>
<td>42.58</td>
<td>103.7</td>
<td>2.86</td>
<td>363.3</td>
</tr>
<tr>
<td>Sweet Pidi</td>
<td>405.8</td>
<td>22.3</td>
<td>11.58</td>
<td>63.44</td>
<td>320.7</td>
<td>8.45</td>
<td>202.5</td>
</tr>
</tbody>
</table>

*Analyzed Values

**Nutrient content of the selected recipes**

The nutrient content of all the products is presented in Table 2.

Cost of the products

Almost all the products were prepared using low cost locally available ingredients which are affordable. Cost was calculated based on the prices of raw materials. The cost of the dishes ranges from 50 paise to Rs. 3 per 100 gm. Sweet balls was the most expensive (Rs.3) and idli, murukku, mixture and pakkavada (50 paise) were the least expensive dishes. Figure 1 and 2 shows the cost of the products.
**Popularization, nutrition education and its impact**

Through the program, mothers were made aware about nutritional needs of children, occurrence and symptoms of malnutrition, need for supplementary foods to tackle malnutrition, amrutham nutrimix and its significance. The products prepared were displayed and popularized during the nutrition education session. A recipe book indicating the proportion of ingredients, method of preparation, yield and serving size was provided to all the participants. The pre and post test scores (Table 3) revealed that the awareness programme conducted was very effective in improving knowledge of the participants about amrutham nutrimix and its nutritional significance in children.

**Table 3: Impact of nutrition education program**

<table>
<thead>
<tr>
<th>No. of subjects</th>
<th>Mean Pre-Test Scores</th>
<th>Mean Post-Test scores</th>
<th>t value</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>30</td>
<td>44</td>
<td>2.7*</td>
</tr>
</tbody>
</table>

* Significant at 5% (P<0.05)

**Conclusion**

Supplementary feeding activities need to be better targeted towards those who need it most and help parents utilize the services effectively to improve their children’s health and nutrition. Amrutham nutrimix, a highly nutritious supplement can help a long way in the treatment and prevention of undernutrition if utilized properly. This study shows that the mix can be incorporated or made into a variety of dishes rather than give it as just porridge. These products, being rich in calories and protein can also be used as a supplementary food for undernourished children. Participation of local self help groups or Kudumbasree units in the preparation and supply of these value added products as ready to eat (RTE) foods can minimize wastage and ensure better utilization by the beneficiaries. Such an arrangement can also empower women as an income generation activity.

**Acknowledgement**

The authors acknowledge the support of all the mothers and children who participated wholeheartedly, the anganwadi centre, Kottayam Dist, Kerala for providing premises and support for conduct of the study and also the Department of Clinical Nutrition & Dietetics, Alphonsa College, Pala, Kerala.

**Reference**


**Supplementary Information**

**Amrutham nutrimix based recipes**

**Sweet balls**

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amrutham powder</td>
<td>60 gm</td>
</tr>
<tr>
<td>Jaggery</td>
<td>25 gm</td>
</tr>
<tr>
<td>Grated coconut</td>
<td>15 gm</td>
</tr>
<tr>
<td>Cardamom powder</td>
<td>½ tsp</td>
</tr>
<tr>
<td>Cashew nut</td>
<td>few</td>
</tr>
</tbody>
</table>

**Method**

Slightly roast amrutham powder. Make jaggery syrup, add grated coconut and roasted amrutham powder. Mix well and switch off the heat. Add cardamom powder, mix well and make into small balls. Garnish with nuts.

**Vegetable roll**

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amrutham powder</td>
<td>60 gm</td>
</tr>
<tr>
<td>Onion</td>
<td>10 gm</td>
</tr>
<tr>
<td>Carrot</td>
<td>10 gm</td>
</tr>
<tr>
<td>Potato</td>
<td>10 gm</td>
</tr>
<tr>
<td>Green peas</td>
<td>10 gm</td>
</tr>
<tr>
<td>Garam masala/ chilly powder</td>
<td>as required</td>
</tr>
<tr>
<td>Salt</td>
<td>to taste</td>
</tr>
<tr>
<td>Oil</td>
<td>for frying</td>
</tr>
</tbody>
</table>

**Method**

Saute vegetables with masala and salt in an oiled pan. To it, add amrutham powder and cook in enough water. Mix well and cook for five minutes. Allow to cool. Shape the mixture and roll in amrutham powder. Deep fry in hot oil till golden brown.

**Ela Ada**

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amrutham powder</td>
<td>70 gm</td>
</tr>
<tr>
<td>Jaggery</td>
<td>15 gm</td>
</tr>
<tr>
<td>Grated coconut</td>
<td>15 gm</td>
</tr>
<tr>
<td>Cumin seed powder</td>
<td>a pinch</td>
</tr>
<tr>
<td>Salt</td>
<td>as required</td>
</tr>
</tbody>
</table>

**Method**

Add roasted amrutham powder, salt, cumin seeds and mix with water to form thick dough. Spread it on small portions of plantain leaf. Make the stuffing by mixing jaggery and coconut gratings. Place the mixture in the centre of the leaf. Fold and steam for 10 mins.

**Vattayappam**

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amrutham powder</td>
<td>60 gm</td>
</tr>
<tr>
<td>Sugar</td>
<td>20 gm</td>
</tr>
<tr>
<td>Grated coconut</td>
<td>20 gm</td>
</tr>
<tr>
<td>Cumin seed</td>
<td>½ tsp</td>
</tr>
<tr>
<td>Cardamom</td>
<td>few</td>
</tr>
<tr>
<td>Yeast</td>
<td>½ tsp</td>
</tr>
<tr>
<td>Salt</td>
<td>to taste</td>
</tr>
<tr>
<td>Ghee</td>
<td>for greasing</td>
</tr>
</tbody>
</table>

**Method**

Add roasted amrutham powder, salt, cumin seeds and mix with water to form thick dough. Spread it on small portions of plaintain leaf. Make the stuffing by mixing jaggery and coconut gratings. Place the mixture in the centre of the leaf. Fold and steam for 10 mins.
Roast amrutham powder and sieve it. Dissolve sugar in Luke warm water and allow the yeast to rise. Make smooth batter with amrutham powder, yeast and sugar. Keep it aside for 4 hours or till it ferments into double its volume.

Grind coconut, cumin seed and cardamom together. Mix with the fermented batter and salt. Pour the batter in to greased moulds and steam cook till done.

### Kinnathappam

**Ingredients**
- Amrutham powder: 70 gm
- Sugar: 15 gm
- Coconut milk: 10 gm
- Cumin seed: 1/4 tsp
- Cardamom: few
- Salt: to taste
- Ghee: for greasing

**Method**

Roast amrutham powder and sieve it. Powder cumin seed and cardamom together and mix with amrutham powder. Add sugar, salt and coconut milk and make a thick batter. Pour the batter into greased moulds and steam cook till done.

### Kumbilappam

**Ingredients**
- Amrutham powder (roasted): 50 gm
- Jaggery: 10 gm
- Grated coconut: 10 gm
- Plantain: 30 gm
- Elaichi: 1 tsp
- Salt: to taste
- Bay leaf: for wrapping

**Method**

Mix all ingredients with water and make thick dough. Roll the bay leaf like a cone and fill it with the dough. Steam cook till done.

### Murukku

**Ingredients**
- Amrutham powder (sieved): 100 gm
- Cumin powder: 1 tsp
- Sesame: 1 tsp
- Chilli powder: 1 tsp
- Salt: to taste
- Oil: for frying

**Method**

Knead amrutham powder with other ingredients and make smooth thick dough. Heat oil in a pan. Fill the dough in a murukku press and squeeze the dough in round pattern over a greased plate. Drop it gently into hot oil. Deep fry till light brown and place it on tissue.

### Mixture

**Ingredients**
- Amrutham powder: 90 gm
- Chilli powder: 1 tsp
- Groundnut (roasted): 10 gm
- Curry leaves: as required
- Salt: to taste
- Oil: for frying

**Method**

Knead amrutham powder, chilli powder, salt and water to thick dough. Heat oil in a pan. Place some dough in the mixture mould and squeeze out in to hot oil. Deep fry till crisp and drain excess oil. Garnish with fried groundnuts and curry leaves.

### Pakkavada

**Ingredients**
- Amrutham powder: 100 gm
- Sesame: 1 tsp

**Method**

Knead amrutham powder, chilli powder, salt and water to thick dough. Heat oil in a pan. Place some dough in the mixture mould and squeeze out in to hot oil. Deep fry till crisp and drain excess oil. Garnish with fried groundnuts and curry leaves.

### Steam cake

**Ingredients**
- Amrutham powder (roasted): 40 gm
- Grated Coconut: 20 gm
- Amaranth leaves (chopped): 10 gm
- Grated Carrot: 15 gm
- Grated Beetroot: 15 gm
- Salt: to taste

**Method**

Add salt to the roasted Amrutham powder. Add water little by little and mix till it gets wet enough for steaming. Put some coconut to the puttu mould, add Amrutham powder, chopped amaranth leaves, carrot, beetroot and coconut one layer after another. Close the lid and steam for 2 minutes.

### Uppuma

**Ingredients**
- Amrutham powder (roasted): 50 gm
- Onion: 10 gm
- Chopped Carrot: 10 gm
- Chopped Beans: 10 gm
- Grated coconut: 20 gm
- Ginger and green chilly chopped: 1 tsp
- Mustard: 1 tsp
- Curry leaves/coriander leaves: as required
- Salt: to taste
- Oil: for sautéing

**Method**

Heat oil in a pan. Add mustard seeds and sauté ginger, chilly, onion, carrot, beans and curry leaves. Pour half cup water to it and add salt. When water boils, sprinkle the fried Amrutham powder. Stir well to prevent lumps. Add coconut. Cover with the lid and cook it for few minutes. Garnish with coriander leaves.
Onion vada

Ingredients Amount
Amrutham powder 60 gm
Onion 40 gm
Green chilly, ginger (chopped) 1 tsp
Curry leaves as required
Salt to taste
Oil for frying

Method
Mix sautéed onion, salt and curry leaves to the Amrutham powder. Make it into thick dough with water. Place some dough on wet plantain leaf. Flatten with hand and make a hole in the centre. Slide the vada into hot oil. Fry till golden brown. Serve hot.

Amruth kheer

Ingredients Amount
Amrutham powder 60 gm
Sugar 20 gm
Coconut milk 200 ml (from 25 gm coconut)
Cardamom powder ¼ tsp
Ghee 10 gm
Cashew nut & raisins few

Method
Dry roast amrutham powder in a thick bottomed pan. Add water and cook till done. Add milk and sugar and boil for 5 mins. Fry nuts and raisins in ghee and add to the kheer. Sprinkle cardamom powder and mix well. Serve hot.

Idiyappam

Ingredients Amount
Amrutham powder 70 gm
Grated coconut 20 gm
Grated carrot 10 gm
Salt to taste

Method
Add hot water and salt to the Amrutham powder and knead to form smooth dough. Put little of the dough to the idiyappam press. Grease idli plate and press the dough in to it. Add coconut and grated carrot on top. Steam for 5-10 minutes.

Chocolate shake

Ingredients Amount
Amrutham powder (roasted) 30 gm
Sugar 20 gm
Whole milk 50 ml
Cardamom powder ¼ tsp
Cashew nuts few
Chocolate powder 3 tsp

Method
Blend all ingredients together in a mixer and serve chilled.

Special cake

Ingredients Amount
Amrutham powder 80 gm
Sugar 20 gm
Milk 20 ml
Egg 2 Nos
Butter 5 tsp
Cashew nut & raisins few

Method
Beat butter and sugar together till fluffy. Whisk the eggs. Fold the amrutham powder with egg and butter mix. Pour in a greased vessel and steam for 45 minutes.

Special Halwa

Ingredients Amount
Amrutham powder 30 gm
Sugar 20 gm
Milk 30 ml
Carrot puree 10 gm
Cardamom powder ¼ tsp
Cashew nut & raisins few
Ghee 10 gm

Method
Mix milk and amrutham powder without any lumps and boil with constant stirring. When the mixture thickens, add carrot puree and sugar and mix well. Add ghee and keep stirring till mixture leaves the sides of the pan. Garnish with fried nuts and raisins.

Sweet pidi

Ingredients Amount
Amrutham powder 60 gm
Sugar 20 gm
Coconut 20 gm
Cumin powder ¼ tsp
Salt to taste

Method
To the Amrutham powder, add ground coconut, cumin powder and mix well to make a dough. Take half of the dough and roll in to small balls. Add more hot water to the rest of the dough and cook till it reaches thick liquid consistency. Add the small balls to the liquid and cook for 5 minutes. Serve hot.

Note: The recipes contained in this supplementary material are to be followed exactly as written. The publisher is not responsible for your specific health or allergy needs that may require medical supervision. The publisher is not responsible for any adverse reactions to the recipes contained in this supplementary material.