

# Nutritive Value of Some Commercial Weaning and Supplementary Foods

Pages with reference to book, From 249 To 252

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## Abstract

Some locally available commercial weaning and supplementary foods were tested for their nutritive value and compared with milk alone or in combination of milk with wheat or wheat bread. Milk alone and Complan were found to be nutritionally superior to all other recipes. Wheat and milk combination were better than Cerelac and Farex in milk and at the same time much cheaper than the commercial weaning and supplementary foods (JPMA 32:249, 1982).

## Introduction

The infant mortality rates in Pakistan are one of the highest in the world and about 80% of the children suffer from protein energy malnutrition in a mild form (Hussain, 1970; Ali and Khan, 1975; Mahmood, 1978). It has been noted that the foods available to the children are usually of a poor quality whereas the head of the family who is normally the wage earner, gets the best of the nutrition. Furthermore the weaning practices are faulty. Mothers lack knowledge regarding nutrition, partly due to illiteracy and partly due to the fact that nutrition does not form a part of the syllabi offered in schools and colleges. Therefore the educated mothers also know little about proper nutrition.

The nutritive values of Farex and some home level weaning food recipes have been compared earlier (Rana, 1972). Khan and Eggum (1979) have also studied Farex and some baby foods and breakfast cereals. The present investigation was carried out to evaluate some commercial weaning and supplementary foods namely Farex, Complan and Cerelac. These were also compared with some simple quick mix recipes of whole wheat, ration wheat and bread prepared by simply soaking these in milk. It is a normal practice for many mothers to soak chappati or bread in milk and feed it to children with the help of a spoon.

## Material and Methods

The weaning and supplementary foods were analysed for approximate composition by the methods of the association of official analytical chemists (Harwitz, 1970).

The recipes were then fed to weaning rats for 15 days and the growth rates, net protein utilisation, net dietary protein energy percent and protein efficiency ratio of these diets were determined by the methods of Pellet and Young (1980).'

The cost of these recipes/400 calories were calculated as the World Health Organization recommends that the weaning and supplementary foods should preferably supply about 400 caloric per day to the infants and children.

## Results

The proximate composition of the various recipes is presented in table I.

Table I  
Approximate Composition of Various Foods

<i>Food</i>	<i>Protein (gm%)</i>	<i>Fat (gm%)</i>	<i>Carbohydrate (gm%)</i>	<i>Energy (K. calories)</i>
Farex alone	9.3	8.0	65.1	372.2
Farex + milk (80:20)	12.5	12.0	56.6	385.8
Complan	16.5	15.6	48.3	399.6
Cerelac	11.1	7.6	61.3	357.6
Ration wheat alone	11.7	2.0	69.7	343.7
Ration wheat + milk (80:20)	14.9	7.5	57.7	357.6
Whole wheat alone	11.1	1.7	70.3	341.1
Whole wheat + milk (80:20)	14.2	7.8	57.6	361.4
Bread	9.9	0.5	45.2	225.3
Bread + milk (80:20)	13.23	6.0	73.4	400.7
Milk	20.6	28.2	37.0	484.0
Control	0.1	—	80.6	322.84

The cost/400 calories of the recipes is shown in table II.

Table II  
Cost per 400 Calories of the Food

<i>Food</i>	<i>Cost</i> <i>(Rs.)</i>
Farex	4.00
Cerelac	6.00
Complan	6.00
Milk	5.00
Ration wheat + milk	1.10
Farex + milk	4.70
Whole wheat flour + milk	1.18
Bread and milk	1.90

The growth rates of the experimental animals are presented in the accompanying figure.

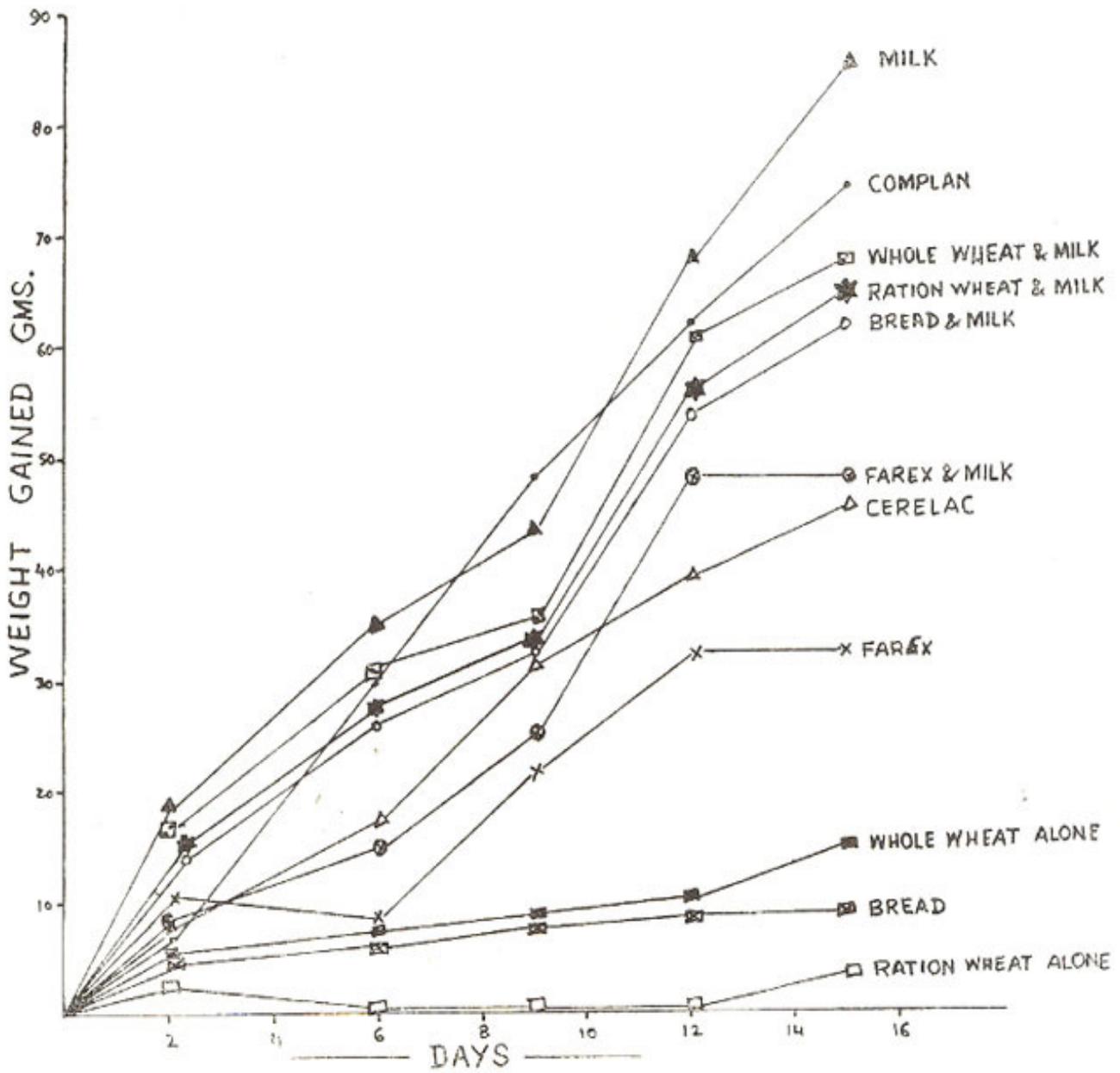


Fig: Growth Rates of Weanling Rats on Various Feed.

Biological value parameters for these recipes are shown in table III.

Table III

## Biological Value of Various Weaning and Supplementary Foods

<i>Food</i>	<i>Net Protein Utilization</i>	<i>Net Dietary Protein Energy %</i>	<i>Protein Efficiency Ratio</i>
Farex alone	63	6.9	2.37
Farex + milk	76	9.8	3.08
Complan	76	12.61	3.00
Cerelac	71	8.8	2.7
Ration wheat alone	40	6.6	0.03
Ration wheat + milk (80:20)	61	10.2	2.3
Whole wheat alone	47	6.1	0.92
Whole wheat + milk (80:20)	64	10.19	2.3
Bread	44	7.8	0.5
Bread + milk	62	7.1	2.1
Milk	80	13.6	2.2

The biological values of these recipes were tested on experimental animals as these techniques are accepted internationally as the standard procedures for evaluation of protein quality of foods. According to Davidson et al. (1979) these animal assays yield values comparable to those obtained in human subjects.

## Discussion

As shown in Table I, the analysis indicates that none of these foods meet the specifications of the World Health Organization which require a minimum of 20% protein of high biological value, though these recommendations are not mandatory.

The cost per 400 calories is lowest for the wheat and milk home made recipes although only Complian has been found to be nutritionally somewhat superior to them.

The best growth rates were observed with milk alone and Complian. The growth rates with Farex and Cerelac were unsatisfactory. The growth of experimental animals on whole wheat and wheat bread was quite poor while there was virtually no growth on ration wheat. This indicates that the flour mills remove the better quality protein from the wheat for making semolina (sooji) and maida.

Whole wheat, wheat bread and ration wheat soaked in milk gave growth rates which were better than Farex with milk or Cerelac. Cerelac is prepared commercially using milk and cereals, and it is probable that the milk proteins in Cerelac get damaged by heat during processing. In the formulation of wheat recipes 80 gm of wheat or wheat bread were mixed with 20 gm of milk powder which is equal to 160 cc of normal cow's milk. This amount is suitable for soaking 80 gm of wheat chappati or bread.

Supplementation with milk has significantly improved the net protein utilization (NPU), protein efficiency ration (PER), net dietary protein energy percent (NDP%) of all the recipes and brought them nutritionally closer to Complian. This is because lysine is the limiting amino acid in wheat, and milk contains enough of it. Therefore, combining wheat with milk raises the nutritive value of wheat significantly. The highest values for NPDE percent (above 12.0) have been obtained with Complian and milk alone and according to the classification of Platt et al. (1961) these are suitable for all age groups including infants, children, adolescents, pregnant and lactating mothers. The NPDE percent of Farex and milk, Cerelac, ration wheat and milk, bread and milk, whole wheat and milk indicates that these recipes are also suitable for infants, children and adolescents but not for lactating mothers. Ration wheat, wheat bread and whole wheat are suitable for adults only (according to Platt, Miller and Payne, 1961, NPDE percent values of 8, 7.5, 5.9, 8, 4.6 and 9.5 satisfy the protein requirements of infants, toddlers, children of 5-9 years, adolescents, adults and lactating mothers respectively).

The NPU value and NDPE percent for Farex was similar to that reported by Khan and Eggum (1979). It may be mentioned here that even the NPU for the average Pakistani diet as reported by Khan and Eggum (1979) is higher than that "for Farex (68 vs 63).

The present study confirms that simple, cheap and nutritious recipes which are based on sound nutrition principles can be easily prepared and used at home. These recipes, which are relatively inexpensive, can be recommended to the women of average income families by their doctors or public health workers.

The commercial weaning foods which are quick to prepare and require no pre-cooking also provide the necessary nutrition but the cost is obviously more than the home made recipes. It is also recommended that Farex should be used in combination with milk whereas Complian and Cerelac may be used as such.

## References

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