

The chemical composition of filled milks in Ghana

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SUMMARY

This article discusses the proximate composition of filled milks produced in Ghana. The proportion of the daily requirement for protein obtained through the consumption of a carton (about 250 g) of filled milk by the various age groups has been included.

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Introduction

Filled milk has been defined by Ballarin (1970) as an emulsion of vegetable fat in skimmed milk. Although this product was introduced in Ghana only 11 years ago, it has already won public acceptance (3·1 million kg were consumed in 1969) especially in the southern half of Ghana.

Two types of filled milk are marketed in Ghana under the trade names "Fan White" and "Fan Chocolate". Numerous researches have been conducted into filled milks particularly with respect to their deficiency in linoleic acid (Corash, 1969; Rubini, 1969), and also in vitamins A and D (Brink, Balsley & Speckman, 1969). This paper

RÉSUMÉ

E. K. ANKRAH: *La composition chimique des émulsions lactées au Ghana.* Cet article discute de la composition approximative des émulsions lactées au Ghana. L'auteur y a inclus l'étude de la proportion de besoins quotidiens en protéines couverte par la consommation d'une boîte (environ 250 gr.) d'émulsion lactée, pour chacun des groupes d'âge d'utilisateurs.

investigates the chemical constituents of the filled milks in terms of the fat, protein, ash and solids-not-fat contents. The protein content has been related to the daily requirement for protein.

Materials and methods

Twelve samples each of Fan White and Fan Chocolate from different production batches were bought from vendors and analysed for the following:

Protein. Total nitrogen content was determined by the Kjeldahl method using macrodigestion procedure. The percentage protein was calculated as $N \times 6 \cdot 38$.

Ash. Ash was measured by ashing 5 g of sample

TABLE 1
Composition of Fan White and Fan Chocolate

Name of sample	Number analysed	Net weight per carton (g)	Protein ($N \times 6 \cdot 38$) (%)	Ash (%)	Fat (%)	Solids-not-fat (%)
Fan White	12	243-256 (248)	2·63-3·41 (3·04)	0·48-0·76 (0·66)	2·24-3·46 (3·01)	8·30-9·74 (8·92)
Fan Chocolate	12	247-256 (251)	3·06-3·60 (3·22)	0·48-0·79 (0·67)	1·42-1·62 (1·55)	9·91-12·66 (11·45)

Figures in parentheses are the mean values.

TABLE 2
Proportion of the Daily Protein Requirement Obtained by the Various Age Groups through the Consumption of a Carton of Filled Milk

Age (in years)	Average body weight (kg)		Requirement for reference protein per caput per day (g) ^c				Requirement for protein from filled milk per caput per day, assuming NPU 75 (g)				Percent daily protein requirement satisfied by consuming one carton of			
	Boys	Girls	Boys	Girls	Pregnant women	Lactating women	Boys	Girls	Pregnant women	Lactating women	Boys	Girls	Pregnant women	Lactating women
1	8.4a	8.4a	15.3	15.3			20.4	20.4			38.0	38.0		
2	10.8a	10.5a	11.4	11.1			15.2	14.8			51.0	52.0		
3	13.3a	13.0a	14.1	13.8			18.8	18.4			41.0	42.0		
4	15.4a	15.1a	15.0	14.6			20.0	19.4			38.5	39.6		
5	19.7b	16.6b	19.1	16.2			25.3	21.6			30.5	35.5		
6	19.7b	20.4b	19.1	19.8			25.3	26.4			30.5	29.0		
16-19			51.8d		42.7	51.7	56.9	68.9			13.6	11.2	14.3	11.8
20-24			52.8d		43.6	52.5	58.1	70.0			13.2	11.0	13.9	11.6
25-29			53.0d		43.6	52.6	58.1	70.1			13.2	11.0	13.9	11.6
30-39			54.0d		44.4	53.4	59.2	71.2			13.0	10.8	13.7	11.4

a. Figures from Ghana, National Food and Nutrition Board (1961b).

b. Figures from Fiwoo, D. K. (1968).

c. Calculation of requirement for reference protein per caput per day was based on requirement per kg body weight per day as in FAO/WHO (1965).

d. Figures from Ghana, National Food and Nutrition Board (1961a).

e. Protein requirements for pregnant and lactating women were calculated as the sum of the normal allowances of 6 g and 15 g reference protein per day for pregnant and lactating women respectively as in FAO/WHO (1965).

f. Note that a small proportion of the total protein was derived from cocoa powder.

in an electric muffle furnace at 550 °C for about 8 h.

Fat. Fat was determined by the Roesse-Gottlieb method as described in FAO/WHO (1966).

Solids-not-fat. The total solids content was determined by evaporating 5 g sample on sand on a water bath and then drying in oven at 105 °C for 4 h. The solids-not-fat content was obtained as the difference between the total solids and the fat content.

Results and discussion

The composition of Fan White and Fan Chocolate is shown in Table 1. Fan White was found to contain 3·04% protein, 0·66% ash, 3·01% fat and 8·92% solids-not-fat. Fan Chocolate contained 3·22% protein, 0·67% ash, 1·55% fat and 11·45% solids-not-fat. The results are similar to those reported by Brink *et al.* (1969) based on almost similar ingredients.

The deduction can be made from Table 1 that a carton of Fan White and Fan Chocolate contained 7·7 g and 8·1 g protein respectively. On the basis of these values, the proportion of the daily protein requirements obtained by the various age groups by drinking a carton of filled milk was calculated (Table 2). For a few illustrations, a 1-year-old boy is supplied with 38% of the daily protein requirement, a 2-year-old boy with 51%, a 6-year-old boy with 30%, a pregnant woman with 13% and a lacting woman with 11%.

Since in Ghana filled milk is not commonly used in the conventional manner as whole milk, but is taken as a refreshing drink, larger quantities can be consumed. The result will be that the percentage of the daily protein requirement satisfied can be high. Indeed, the protein intakes of the groups involved can be improved if the consumption of filled milk is encouraged.

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