



FORMULATION OF PROTEIN AND CALCIUM RICH RECIPES FOR TEENAGERS

Deepika Dawar* Vinti Davar**

*Freelance Dietitian, Panipat.

** Professor, Department of Home Science, Kurukshetra University, India.

Abstract

Eating well is often hard for teenagers. Hanging out with friends, frequent fast food outlets and snacking can lead to excessive intake of fats, sugar and calories & insufficient intake of important vitamins and minerals. Adolescence is a crucial period of growth since it offers the second and last chance to catch up growth in life cycle of individuals. Also it is the time for increased nutritional needs. Failure to consume an adequate diet at this time can result in delayed sexual maturation and can arrest or slow linear growth. Addition of important nutrients such as Proteins and Calcium can help to meet the increased nutritional needs and overcome nutritional deficiencies among teenagers. Use of easily available home made products is not only a healthy; also a capable and cost effective means to reach to large number of teenagers considering their likes and preferences for consuming a recipe. In the present study three Protein and Calcium rich recipes were formulated. The sensory evaluation was judged by 10 teenagers using 9-point Hedonic scale and it was found that all the formulated recipes were overall acceptable by teenagers. The overall acceptability of sesame coconut dal dosa was maximum (8.7₊0.48) followed by honey cheese gram salad (8.4₊0.51) and roasted ragi channa laddoo (7.8₊0.63) respectively.

Keywords: Teenagers, Calcium, Protein, Recipe, Adolescents.

Introduction

Adolescence is a crucial phase of growth since it offers second and last chance to catch up growth in the life cycle of individuals. Adolescence is a period of peak growth for boys and girls (1). WHO defines adolescents as persons in the age-group of 10 to 19 years. In India, there are an estimated 190 million adolescents comprising over one-fifth of the entire population.(2) The phenomenal growth that occurs in adolescence, second only to that in the first year of life, creates increased demands for energy and nutrients. Total nutrient needs are higher during adolescence than any other time in the lifecycle. Nutrition and physical growth are integrally related; optimal nutrition is a requisite for achieving full growth potential (3). Failure to consume an adequate diet at this time can result in delayed sexual maturation and can arrest or slow linear growth (3). The development of healthy eating habits is important as the rapid physical growth in adolescence is associated with increased nutritional needs. Various studies on diet and nutrition intake of adolescents and young adults in the developed world have shown that their diets are often high in fats and refined carbohydrate. On average, adolescents consume diets that are inadequate in several vitamins and minerals, including folate, vitamins A and E, iron, zinc, magnesium and calcium (4-7). Dietary fiber intake among adolescents is also low. Diets consumed by many teens exceed current recommendations for total fat and saturated fat, cholesterol, sodium and sugar. Teenagers have increased requirement for certain nutrients and Protein is an essential nutrient for growth and maintenance of tissues. During the adolescent growth spurt, protein needs are high and utilization of protein is dependent on adequate energy intake. Even if the protein intake is sufficient, it cannot be utilized for growth unless energy requirements are met (8). Calcium needs during adolescence are greater than they are in either childhood or adulthood because of the dramatic increase in skeletal growth. Because about 45% of peak bone mass is attained during adolescence, adequate calcium intake is important for the development of dense bone mass and the reduction of the lifetime risk of fractures and osteoporosis (9). Milk provides the greatest amount of calcium in the diets of adolescents, followed by cheese, ice cream and frozen yogurt (10). Addition of important nutrients such as Proteins and Calcium can help to meet the increased nutritional needs and overcome nutritional deficiencies among teenagers. Use of easily available home made products is not only a healthy; also a capable and cost effective means to reach to large number of teenagers considering their likes and preferences for consuming a recipe. Keeping above point in view, the present study was conducted to formulate protein and calcium rich recipes for teenagers.

Methodology

Procedure

The present study was conducted for formulation and assessment of acceptability of protein and calcium rich recipes by adolescents. All the ingredients were selected on the basis of their protein and calcium content and easy availability. The ingredients required were procured in a single lot from local market, sorted out and required pre preparation was done discussed below in Table 1, 2, 3 respectively.

Sensory Analysis

The sensory quality of the developed product in respect of color and appearance, texture, flavor and taste, overall Acceptability was judged by 10 adolescents using 9-point Hedonic scale.



Statistical Analysis

All the results were collected and analyzed using mean and standard deviation.

Results & Discussion

The method and results obtained from the present investigation has been presented as Table 1, 2, 3. All the three recipes formulated in the study were very rich in protein and calcium.

Table: 1 Sesame Coconut Dhal Dosa

Name	Method	Ingredients	Weight (gm)	Content Protein (nx6.25)gm	Content Calcium (mg/100gm)	No of Servings
Sesame Coconut Dhal Dosa	1.Wash and soak all the dhal for 2 hours. 2. Grind them to a mixture and leave it for fermentation for 6 hours 3 Add salt, oil and water to make it a batter of flowing consistency. 4. Pour one spatula of the batter on a non stick griddle and spread to shape a dosa 5. Once cooked add coconut and sesame and raisins. 6. Fold the dosa and serve hot.	Bengal gram dhal	25	5.2	14	5
		Red gram dhal	25	5.6	18.3	
		Black gram dhal	25	6	38.5	
		Green gram dhal	25	6.1	18.8	
		Shredded coconut	25	1.7	100	
		Roasted Sesame seeds	20	3.7	290	
		Raisins	25	0.5	21.8	
		Oil	1 tbsp			
	Salt	to taste				
Total			170	28.8	501.4	

Plate 1: Ingredients Used in Preparations





Plate 2: Preparation of Sesame Coconut Dhal Dosa



Table: 2 Honey Cheese Gram Salad

Name	Method	Ingredients	Weight(g)	Content Protein (nx6.25)g	Content Calcium (mg/100)	No of servings	
Honey Cheese Gram Salad	1. Hang curd in a muslin cloth to remove excess water 2. Cut cheese cucumber & tomato into small cubes. 3. In a small bowl put boiled black grams. 4. Add cheese, cucumber and tomato cubes to it 5. Add hung curd, coconut, honey, green chilies & coriander to it. 6. Mix honey, sesame seeds & empty the contents in a glass plate. 7. Decorate with remaining cucumber & tomato and serve cold.	Boiled black gram	100	22.5	58		
		Cottage cheese	100	24.1	790		
		Curd					
		Cucumber					
		Tomatoes	200	6.2	149		
		Shredded coconut	100	0.4	10		
		Roasted sesame seeds	100	0.9	48		
		Coriander leaves	20	4.5	10		
		Green chilies	20	3.7	290		
		Honey	20	2.8	126		
Salt	10	1.6	3				
	5tsp to taste		-	1.25			
Total			750	66.7	1631.55		



Plate3: Preparation of Honey Cheese Gram Salad



Table 3: Roasted Ragi Channa Ladoo

Name	Method	Ingredients	Weight(g)	Content Protein (nx6.25)g	Content Calcium (mg/100)	No of Serving
Roasted Ragi Channa Ladoo	1. Dry roast ragi flour in a pan 2. Grind roasted channa, sunflower seeds, jaggary, and cardamom in a mixer. 3. Coarsely grind ground nuts in a mixer. 4. Put the contents of mixer in a bowl. Add roasted sesame seeds, Raisins and Ghee to it. 5. Mix it well & divide the mixture into 10 parts & shape it into ladoos.	Roasted channa	100	22.8	58	10pieces
		Ragi flour	50	3.65	172	
		Sunflower seeds	25	4.95	70	
		Roasted sesame seeds	25	4.6	363	
		Raisins	25	0.5	21.8	
		Groundnuts	50	13.1	38.5	
		Jaggary	150	0.6	120	
		Cardamom powder	05	-	6.5	
Ghee	2 tbsp	-	-			
Total			430	50.2	849.8	



Plate 4: Preparation of Roasted Ragi Channa Ladoo



Table 4: Sensory Evaluation of Recipes

Recipe	Color	Texture	Flavor	Taste	Over all acceptability
Sesame Coconut Dhal Dosa	8.3±0.67	7.9±0.57	8.3±0.82	8.6±0.70	8.7±0.48
Honey Cheese Gram Salad	7.8±0.79	7.5±0.85	7.7±0.48	8.3±0.48	8.4±0.52
Roasted Ragi Channa Ladoo	7.4±0.52	7.3±0.48	7.5±0.53	8.0±0.67	7.8±0.63

Table 4 shows that different ingredients used in the recipes improve the, taste, texture, flavor and color. The sensory evaluation of all the three recipes formulated for teenagers reveal that the taste, texture, flavor and color of sesame dhal dosa was maximum and minimum in roasted ragi channa ladoo. The color, texture, flavor and taste of sesame coconut dhal dosa was the best and over all acceptability of again sesame coconut dhal dosa was maximum (8.7±0.48) followed by honey cheese gram salad (8.4±0.52) and roasted ragi channa ladoo (7.8±0.63) respectively.

The overall acceptability of all the formulated recipes was good. These recipes are rich in Proteins and Calcium given in these recipes serve as a healthy choice for a teenager. Eating nutrient rich recipes will help the teenagers to grow well, keep bones and muscles healthy, and improve their nutritional status as well as satisfy their cravings that propel them to eat junk or unhealthy snacking substitutes.

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