

Formulation And Sensory Evaluation Of Reduced Fat (Rf) High Protein Mayonnaise

Shuchi Upadhyay, Ajay Singh, Deepika Kohli, Sanjay Kumar, Richa badora
Department of Chemistry, UCALS, Uttaranchal University, Dehradun

*Corresponding author: shuchi.diet@gmail.com

Received: (21 Sept. 2020) Revised: (1 Oct 2020) Accepted: (2 Dec 2020)

Abstract: Mayonnaise is one of emulsion food are popular and are consumed all over the world because of the special texture and taste. Mayonnaise commonly used for dressings of salad and spreading in bread and buns. It is a typical oil-in-water (O/W) type emulsion in which lipid is dispersed in water. The aim of present study is to formulate low fat high protein mayonnaise. Reduced fat (RF) mayonnaise was formulated by replacing part of the oil with refined wheat flour gelatinized rice starch and the effect of their inclusion on the sensory properties was investigated. the overall samples of mayonnaise in different ration of soya flour, rice flour and refined wheat flour were prepared. The results were shows that Reduced fat mayonnaise has good taste and appearance. With sensory score of taste were $9.6 \pm .137$ and control sample was $7.8 \pm .233$. the sample L.F.M. and M.F.M. has good amount of protein $10.6 \pm .152$ and $11.5 \pm .153$ respectively. the overall acceptability of sample R.F.M was $9.3 \pm .128$ which was good in taste and aroma.

Key words: Mayonnaise, Reduced fat, Refined wheat flour, Soya flour, Rice flour, Sensory evaluation

INTRODUCTION

Mayonnaise is one of oil in water emulsified food containing egg, vinegar oil and seasoning with sugar . stability and creaming texture is one of the most important qualities of mayonnaise. All specific features of mayonnaise represent the presence and quality of Mayonnaise. it is a kind of creaming oil-in-water emulsion containing 70 to 80% fat. Conventionally mayonnaise prepared by carefully mixing egg yolk, vinegar, oil, and seasonings. Low physical activity health related concerns, there has been pressure on the food industry to reduce the amount of fat, sugar, cholesterol, salt and certain additives in the diet (Abdullah et al 2010) Among mayonnaise ingredients, egg yolk is most critical for the stability of the product Abu (Ghoush et al 2008) egg white or whole egg in mayonnaise is for stability and good taste . the emulsification in this food carried out by egg itself. (Bortnowska G. et al 2009)

Replacement of ingredients like egg yolk and cooking oil is for reduction of calories and total fat . different addition and experiment is done for replacement of conventional method of mayonnaise to reduced fat like a decrease in cholesterol content and, generally, in fat content, an increase in microbiological stability and, in some cases, lower costs of manufacture. (Cornell, J et al 2002) For that reason, the emulsification and stabilizing properties of animal proteins such as whey protein, casein protein have been extensively investigated by a number of researchers (DePaolis et al 2002) to provide conventional taste of mayonnaise with reduced amount of fat and calories is the aim of present study is to formulate R.F. mayonnaise.

MATERIALS AND METHODS

All raw ingredients refined wheat flour,soya bean flour, rice flour, refined oil, salt and sugar, were purchased from local market of Dehradun Uttarakhand

Preparation of mayonnaise:

The raw ingredients for different samples of mayonnaise were purchased from local market of Prem Nagar Dehradun. all raw ingredients were mixed together then whole egg and vinegar mixed separately. continues stirring were done to get good soft texture of mayonnaise. Homogenizer and stirrer were used to make smooth paste. The ratio and preparation were as table 1. The process of mayonnaise preparation were similar as figure 1

Table 1: L.F.M. (Low fat mayonnaise), H.F.M. (High fat mayonnaise), M.F.M. (Moderate fat mayonnaise) and R.F.M. (Reduced fat mayonnaise)

INGREDIENTS	L.F.M.(%)	H.F.M. (%)	M.F.M. (%)	R.F.M (%)
Egg :	10	20	15	10
vinegar :	4	4	4	4
Refines wheat flour	10	10	10	10
soya flour	05	10	15	20
Rice flour	05	10	10	10
Sugar :	1	1	1	1
Salt :	1	1	1	1
Soyabean oil :	40	80	60	10
Seasonings	0.5	0.5	0.5	0.5
Water	8	10	20	15
Lemon juice	0.5	0.5	0.5	0.5

Sensory evaluation:

The sensory evaluation of mayonnaise is done after one-day complete air tight containerstorage in room temperature. Sensoryattributes containing appearance, color, odor, texture, taste, and overall acceptance.

All parameters were evaluated by 10 panelists of male and female faculty members of Food Technology Department at Uttarakhand University of Dehradun (age 22 to 40 years old) on 9-point hedonic scale. Before the sensory evaluation, all food tech faculty panelists were informed about the sensory attributes. Water was provided between samples to cleanse the palate and mouth wash.

Proximate evaluation:

Moisture, protein, and ash, fat , contents were determined according to [AOAC \(2005\)](#) official methods. Carbohydrates were determined by subtracting the sum of moisture, protein, fat, and ash percentages from 100%.

➤ EGG AND VINEGAR WERE MIXED TOGETHER



➤ MIXING OF SEASONINGS, SALT AND SUGAR



➤ CONTINUES STIRRING AND HOMOGENIZING



➤ FINALLY POURED OIL IN MIXTURE



➤ MIXING AT 1600 RPM FOR 1 MIN TO 4 MIN



➤ FILL IN AIR TIGHT CONTAINER,

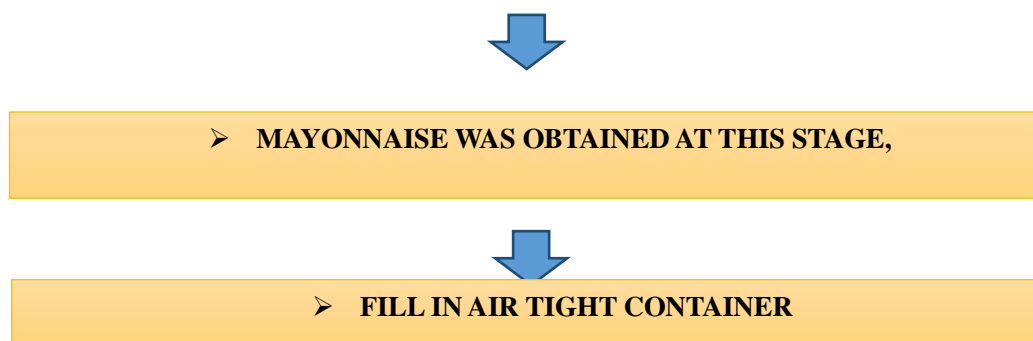


Figure 1: Flow diagram of preparation of mayonnaise

Statistical analysis: Data of sensory analysis and proximate value were analyzed using standard deviation and standard error method. five replicates were used for determination of each parameter. (Montgomery1984)

RESULTS AND DISCUSSION

Sensory results:

The sensory score of different samples were shown their different value of colour , aroma, taste and overall acceptability

Table 2: C.M. (control mayonnaise), L.F.M. (Low fat mayonnaise), H.F.M. (High fat mayonnaise), M.F.M. (Moderate fat mayonnaise) and R.F.M. (Reduced fat mayonnaise)(n=3)

Sensory attributes	C.M	L.F.M.	H.F.M.	M.F.M.	R.F.M
Color	8.85± .166	8.7±.324	8.9±.111	9.0±.277	8.6±.141
Appearance	7.4± .213	7.9±.344	8.4±.122	8.6±.188	8.8±.152
Aroma	6.0± .121	6.8±.211	6.3±.364	7.2±.128	8.6±.126
Texture	8.0± .001	8.6±.266	7.9±.216	7.5±.120	8.9±.161
Taste	7.8±.233	7.3±.188	8.4±.213	8.7±.285	9.6±.137

Overall acceptability	8.4±.177	8.8±.255	8.6±.333	9.5±.103	9.3±.128
-----------------------	----------	----------	----------	----------	----------

Proximate results:

The nutritional and proximate value of total samples were effected by their composition and mixing timing. the Ash content value of L.F.M. sample was 0.88±.188 and sample H.F.M. was 0.89±.167 because of amount of rice flour and soya flour. Mayonnaise containing high soya flour have high amount of protein in sample H.F.M. with protein value 11.8±.151. fat content of mayonnaise determined their shelf life and total calorific value the sample R.F.M have 1.3± .125 fat value which is reduced amount of fat value as compared to control sample

Table 3: proximate content of different samples(n=3)

Samples	Ash content	Moisture content	Protein content	Fat content
C.M.	0.81± 022	11.89±.144	10.77±.164	3.7±.171
L.F.M.	0.88±.188	22.18±.121	10.6±.152	2.8±.176
H.F.M.	0.89±.167	25.17±.122	11.8±.151	5.5±.128
M.F.M.	1.34±.123	26.19±.126	11.5±.153	3.9± .113
R.F.M	1.32±.129	29.11±.125	09.7±.157	1.3± .125

CONCLUSION

A good quality nutritious mayonnaise could be manufactured by incorporating vinegar, egg, different oil and seasoning. incorporating soy flour in samples increase total value of protein in mayonnaise. the mayonnaise containing low fat could be one of potion for regular morning diet in child, adolescent and elderly for their regular energy and nutrient requirement

Acknowledgement:

My sincere thanks to Vice Chancellor of Uttaranchal University and Principal of UCALS for well-equipped laboratory their equipment and guidance for successful completion of this research work .

References

1. Abdullah, N., & Chin, N. L. (2010). Simplex-centroid mixture formulation for optimized composting of kitchen waste. *Bioresource Technology*, 101,
2. Abu Ghoush, M., Samhoury, M., Al-Holy, M., & Herald, T. (2008). Formulation and fuzzy modeling of emulsion stability and viscosity of a gumeprotein emulsifier in a model mayonnaise system. *Journal of Food Engineering*, 84, 348e357.
3. AOAC (2005) Association of Official Analytical Chemist. *Official Methods of Analysis*. 18th Edition, Washington DC
4. Bortnowska, G., & Tokarczyk. (2009) Comparison of the physical and sensory properties of model low fat mayonnaises depending on emulsifier type and xanthan gum concentration. *Electronic Journal of Polish Agricultural Universities*, 12(3).
5. Cornell, J. (2002). *Experiments with mixtures: Designs, models, and the analysis of mixture data* (3rd ed.). New York: John Wiley and Sons, Inc.
6. DePaolis. (1979). Process for preparing an imitation mayonnaise and salad dressing. United States Patent. No. 4,163,808.
7. Garcia, B. G., Sanchez, R., Jose, L., Villavicencio, D., & Nunez, M. (2002). Influence of formulation in the stability of dressing-type mayonnaise. *Alimentaria*, 39(338), 87.90.
8. Montgomery, D.C. 1984. Experiments to compare several treatments: The analysis of variance. In *Design and Analysis of Experiments*, 2nd ed. p. 43-80. JohnWiley Book Co, New York.
9. Yoshimoto, T. and Sato, K. (2001). Properties of soymilk and yogurtlike food prepared by using defatted soybean flour. *Nippon Shokuhin Kagaku Kougakukaishi*, **48**, 906–912 (in Japanese).