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RESEARCH PAPER

Studies on preparation of soy coffee powder

■ KAVITA MORE, M.S. PAWAR AND K.R. MALPANI

SUMMARY : In the present study the soy coffee powder was prepared from soybeans, jaggery and fenugreek seeds. Soaked soybeans were dried in tray drier at 60^0C for 6 hr and then roasted in oven at 115^0C for 15 min. Roasted soybeans were dehulled and grounded to obtain fine powder. Soy powder obtained was mixed with jaggery powder and fenugreek seed powder and different flavors (vanilla powder, aniseed powder and cocoa powder).Protein contents in the samples of soy coffee powder were found in the range from 36.23 to 38.69 per cent. The maximum protein content was found in the sample containing same proportion of soy powder and jaggery powder followed by sample with cocoa powder. The carbohydrates in the samples were found in the range from 21.60 to 22.00 per cent. Moisture content and ash content in the samples were found in the ranges from 3.30 to 3.60 per cent and 4.00 to 5.00 per cent, respectively. Fat content found in the samples was in the range from 12.00 to 18.50 per cent.

Key Words : Soybeans, Soy coffee powder, Jaggery powder, Sensory evaluation

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Soybean (*Glycine max* L. Merril) is a member of the family leguminoseae, sub-family Papilionoideae and genus *Glycine*. Soybean originates from China. Five major soybean producing countries of the world are U.S.A (31.70%) Brazil (27.90%), Argentina (21.10%), China (6.50%) and India (4.30%) (Ali, 2009). Soybean production in India during 2007-2008 was about 9.47 million tons with an average yield of 1070 kg/ha. Madhya Pradesh ranks first in soybean production which produces 4.98 million tons (52.4%) with productivity of 1021 kg/ha, Maharashtra ranks second in soybean production which produces 3.24 million tons (34.1%) with productivity of 1221 kg/ha.

Soybean provides high quality protein. It contains all the three macronutrients required for good nutrition as well as fiber, vitamins, minerals. It also provides all essential amino acids in the amount needed for human health. Soy foods and soy based dairy analogs are served as a balanced and remedial substitute of dairy milk for lactose intolerant persons, since soybean has no lactose in it. Soy protein lowers the total and LDL cholesterol level and increases the level of HDL and it provides omega-3 fatty acid which reduces the risk of heart disease. Soy foods contain is flavones which reduce health risk associated with menopause and osteoporosis. Isoflavones also fight with cancer. Soy protein concentrate and soy protein isolate gives 330 cal/100g. The soy based diet lower the incidences of obesity. Active isoflavone compounds found in soy, specifically, genistein which helps to produce smaller and fewer fat cells.

Numbers of peoples are interested to have a cup of coffee in the morning and after lunch or dinner. Coffee stimulates the nervous, cardiovascular and respiratory systems. But coffee contains 30 to 120 mg/cup of caffeine. Caffeine shows side effects on health such as abdominal pain, diarrhea, and fast heart beats, increases urination, trouble in breathing, restless sleep, nervousness etc. Soy coffee provides benefits of soy with a coffee taste. However, soy coffee gives beneficial effects

MEMBERS OF THE RESEARCH FORUM

Author for Correspondence :
KAVITA MORE, M.T. College of Food Technology, Rajbag Educational Complex, Loni Kalbhor, PUNE (M.S.) INDIA
Email : kavita83.more@rediffmail.com

Coopted Authors:
M.S. PAWAR AND K.R. MALPANI, MT College of Food Technology, Rajbag Educational Complex, Loni Kalbhor, PUNE (M.S.) INDIA
Email : mangalpawar32@gmail.com; malpani_krishna@yahoo.co.in

which include younger looking skin, reduces hot flashes, improve sleeping, lower cholesterol, promote healthy prostate function, promote healthy and strong bones and joints, increases lean muscle mass, reduce risk of heart disease.

EXPERIMENTAL METHODS

Soybean seeds:

Soybean seeds (var. JS335) were purchased from local market of Hadapsar, Pune.

Ingredients:

Pure jaggery and fenugreek seeds were purchased from local market of Hadapsar, Pune. This jaggery was dark yellow in colour.

Soybean
(var. *JS355*)
↓
Sorting and grading
↓
Washing
↓
Soaking
(Water, 3hr)
↓
Cooking
(Water, 30 min)
↓
Drying
(60^0C, 6 hr)
↓
Roasting
(115^0C, 15 min)
↓
Dehulling
↓
Grinding
(Mixer grinder)
↓
Roasted soy powder
↓
Mixing of ingredients
(Jaggery powder and fenugreek seed powder)
↓
Addition of flavors
(Vanilla powder, aniseed powder and cocoa powder)
↓
Packaging
(Plastic jar)

Fig. A : Process flow chart for preparation of soy coffee powder

Flavours:

Aniseed, vanilla powder, cocoa powder were purchased from local market of Pune.

Chemicals:

Chemicals required for processing and analysis were taken from J.P.Gandhi Chemicals,

Equipments:

Equipments required for processing and analysis were taken from M.I.T.C.F.T, Pune.

The detailed process for preparation of soy coffee powder is given in Fig. 1. The Samples prepared for soy coffee powder is given in Table A.

Preparation of soy powder:

Soybeans were cleaned manually. They were graded for uniform size.

Chemical analysis:

Raw material and final products were analyzed for moisture content, carbohydrates, protein, fat and ash content.

Moisture content:

For determination of moisture content standard oven method was used (AOAC, 1975).Samples were taken in Petri plates and dried in hot air oven at 105^0C temperature until the material were bone dry. The samples were then removed from oven and cooled in desicator for 20 min. The samples were then weighed and determined moisture content of sample.

Total carbohydrates:

Total carbohydrates of samples were determined by Anthrone method (Ranganna, 2007).

Protein:

Protein content of samples was determined by Micro-Kjeldahl method (Ranganna, 2007).

Fat:

Fat content of samples were determined by using Soxhlet apparatus (Ranganna, 2007).

Ash content:

Ash content of samples was determined by using Muffle furnace (Ranganna, 2007).

Sensory evaluation:

The sensory evaluation of different organoleptic properties *viz.,* color and appearance, mouthfeel, taste, flavor,

Table A : Samples prepared for soy coffee powder

Sample	Soy powder (%)	Jaggery powder (%)	Fenugreek seed powder (%)	Vanilla powder (%)	Aniseed powder (%)	Cocoa powder (%)
S_1	100	100	2	0	0	0
S_2	100	50	2	0	0	0
S_3	100	100	2	20	0	0
S_4	100	100	2	0	20	0
S_5	100	100	2	0	0	20

and overall acceptability were carried by a panel of 10 judges of different groups and food habits on basis of 9 point Hedonic scale. The average score was calculated for individual organoleptic properties. The overall acceptability score 7 to 9, 5 to 6 and below 5 were evaluated as more acceptable, acceptable and not acceptable products, respectively.

EXPERIMENTAL FINDINGS AND ANALYSIS

In the present investigation of preparation of soy coffee powder, soybean seeds were procured from local market. They were cleaned and graded. The chemical composition of soybeans, jaggery and fenugreek seeds were determined. The soybeans were soaked, cooked and dried in tray drier. The dried soybeans were roasted, dehulled and grounded to prepare soy powder. The soy powder was mixed with jaggery powder and fenugreek seed powder and different flavours (vanilla powder, aniseed powder and cocoa powder) were added. The quality assessment was done. Chemical properties *viz.,* moisture content, carbohydrates, protein, fat and ash content were determined. Organoleptic properties of soy coffee powder were determined.

Chemical properties of raw material:

Chemical properties of soybean seeds, jaggery and fenugreek seeds were determined and tabulated in Table 1.

Chemical properties of products:

Chemical properties of product were determined and tabulated in Table 2.

Organoleptic properties:

Data on organoleptic properties of various products is tabulated in Table 3. Effect of different samples on organoleptic properties of overall acceptability is plotted and shown in Fig. 1 of different samples of soy coffee powder.

Table 1 : Chemical properties of raw material

Raw material	Moisture content (%)	Carbohydrate (%)	Protein (%)	Fat (%)	Ash content (%)
Soybean	8.20	22.00	42.96	19.00	5.00
Jaggery	6.80	85.00	0.50	0.08	1.50
Fenugreek seeds	9.40	20.00	29.71	8.20	3.50

Table 2 : Chemical properties of products

Sample	Moisture content (%)	Carbohydrate (%)	Protein (%)	Fat (%)	Ash content (%)
S_1	3.30	21.60	38.69	12.00	4.00
S_2	3.40	22.00	36.23	15.00	5.00
S_3	3.40	22.00	37.36	17.50	4.00
S_4	3.50	21.90	37.00	18.50	5.00
S_5	3.60	22.00	37.86	16.00	5.00

Table 3 : Average organoleptic properties

Sample	Color and appearance	Mouthfeel	Taste	Flavor	Overall acceptability
S_1	7	7	7	7	7
S_2	7	7	7	7	7
S_3	8	8	8	7	8
S_4	7	8	8	7	8
S_5	8	7	8	8	8

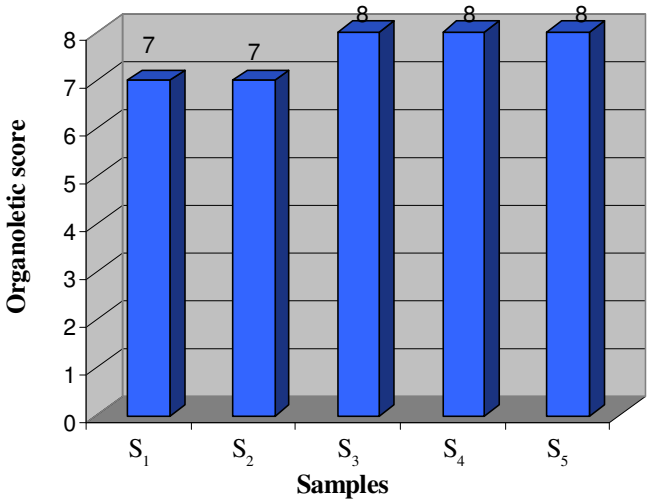

Fig. 1 : Effect of different samples on overall acceptability

Conclusion:

Indian population is predominately vegetarian. Soybean products can easily meet the protein requirement of vegetarian diet. Soybean is protein rich legume with economic price. So it is called as poor man protein. It can be utilized in many ways with good acceptability .Moisture content, carbohydrate, protein, fat and ash content of soybean were found 8.20 per cent, 22.00 per cent, 42.96 per cent, 19.00 per cent, 5.00 per cent, respectively. The content of jaggery were found 6.80 per cent moisture content,85.00 per cent carbohydrate, 0.50 per cent protein, 0.08 per cent fat and 1.50 per cent ash content. Moisture content, carbohydrate, protein, fat and ash content of fenugreek seed were found 9.40 per cent, 20.00 per cent, 29.71 per cent, 8.2 per cent and 3.5 per cent, respectively. Moisture content in the samples was found in the range 3.30 to 3.60 per cent. The organoleptic score of all samples soy coffee powder were ranged between 7 and 8. Soy coffee powder prepared from soybean is a rich source of protein and is free from caffeine.

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