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ASSESSMENT OF NUTRITIONAL QUALITY OF DEVELOPED PRODUCT (MUFFIN & VERMICELLI) BY USING DIFFERENT TYPE OF SEEDS

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ABSTRACT

Seeds are finding its place in today's lifestyle as they are rich in nutrients and have numerous benefits. This study was conducted on assessment of nutritional quality of developed product muffin and vermicelli using different types of seeds. In this study, three different seeds were used i.e. Pumpkin seeds, Flax seeds, and Muskmelon seeds. Four different samples of muffin were prepared, Sample A was the control sample, Sample B (P.S + oats flour) in the ratio 40:20, Sample C (F.S + oats flour) in the ratio 40:20, sample D (M.S + oats flour) ratio 40:20. In vermicelli flour different samples were prepared Sample A was control sample, Sample B (wheat flour+ semolina + P.S) in ratio (40:40:20), Sample C (wheat flour + semolina + F.S) in ratio (40:40:20), Sample D (wheat flour+ Semolina + M.S). All the samples were analyzed on sensory parameters and result concluded that in muffin sample D (Musk melon seeds + oats flour) was most acceptable and in vermicelli Sample C (wheat flour + Semolina + Flax seeds) was most acceptable. Result showed that proximate analysis of Muskmelon seeds enriched muffin has high nutritional value as compare to raw form and shelf life of muffin was up to 5 days. In vermicelli, nutritional value was higher in cooked form as compare to its raw form.

Keywords: P.S (Pumpkin Seeds Flour), F.S (Flax Seeds Flour), M.S (Musk-melon Seeds Flour)

INTRODUCTION

The most eaten food in the world are bakery products. The texture of cakes is spongy and have special organoleptic characteristics (Masoud *et al*., 2015). Muffin is a type of bread which can be sweet and savory. It generally looks like small cakes or cup cakes. In muffin any type of frosting is not required (Singh *et al.,* 2019). Muffin mostly liked by peoples because of their soft texture and unique taste (Ureta *et al.,* 2013).

Vermicelli is a type of noodle (Sirirat *et al.,* 2005). Vermicelli can be cook easily in a short period of time. Generally vermicelli can be made from refined flour or semolina (Ranganna *et al.,* 2014). The perfect instant food is vermicelli and comes under the category of extruded product (Lande *et al.,* 2017).

Pumpkin seeds belongs to the family *Cucurbitaceae* and antioxidant present in it (Manda Devi *et al.,* 2018). Nowadays pumpkin seeds use as a snack (Kaur *et al.,* 2018). Some pharmacological activities like antifungal, Anti bacterial, anti inflammatory and antioxidant activity are found in these seeds (Kaur *et al.,* 2018)

Flax seeds belongs to the family *Linaceae*. These seeds loaded with omega 3, digestible proteins and lignans. It is a good source of linoleic acid oil and lignans. High amount of proteins is present in flaxseeds (Chisty *et al.,* 2016). In flax seeds short chain polyunsaturated fatty acid (PUFA), soluble and insoluble fiber and also antioxidants is found in flax seeds which is helpful in many harmful diseases like cardiovascular diseases, cancer etc. (Goyal *et al.,* 2013).

Musk melon is a member of *Cucurbitaceae* family. This seeds shows some medicinal properties like analgesic, anti fungal, anti inflammatory, anti oxidant, anti diabetic, anti diuretic properties (Mehra *et al.,* 2015). Glyceride oil and proteins present in musk melon seeds (Petkova and Antova, 2015).

MATERIAL & METHOD

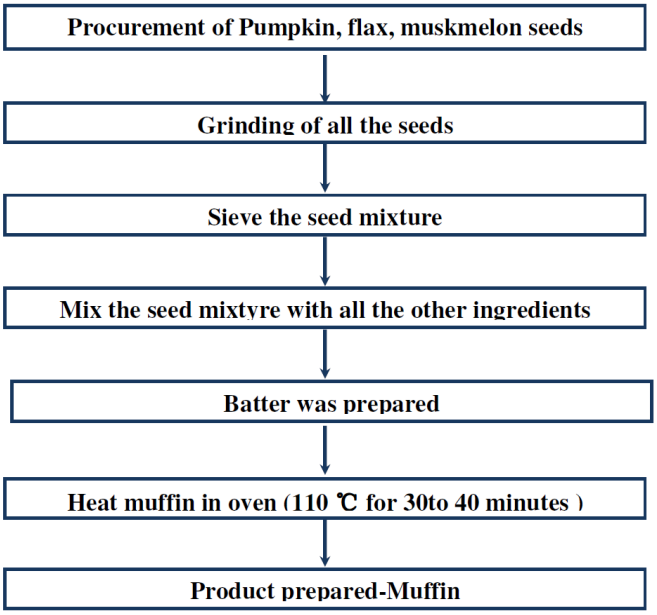
Preparation of muffin

Pumpkin seeds, Flax seeds, Muskmelon seeds, refined flour oats flour and other materials were collected from local market of NIT Faridabad. Then next step was the preparation of muffin. Four samples of muffin were prepared i.e. sample A, B, C, D. Sample A was control sample prepared by using refined flour about 60 gm, baking soda and baking powder about half spoon, curd About 10 gram better (5 gram) sugar (5 gram) vinegar 1spoon, milk 20ml and at last 2 -3 drops off vanilla essence. Then pour the prepared batter into the muffin container and heat it at (110º Celsius for 30 to 40 minutes) In sample B (pumpkin seeds flour and oats flour In the ratio (40:20) added in place off refined flour, sample C-flax seeds flour and oats flour in the ratio (40:20) in sample D muskmelon seeds flour and oats flour added ratio (40:20).

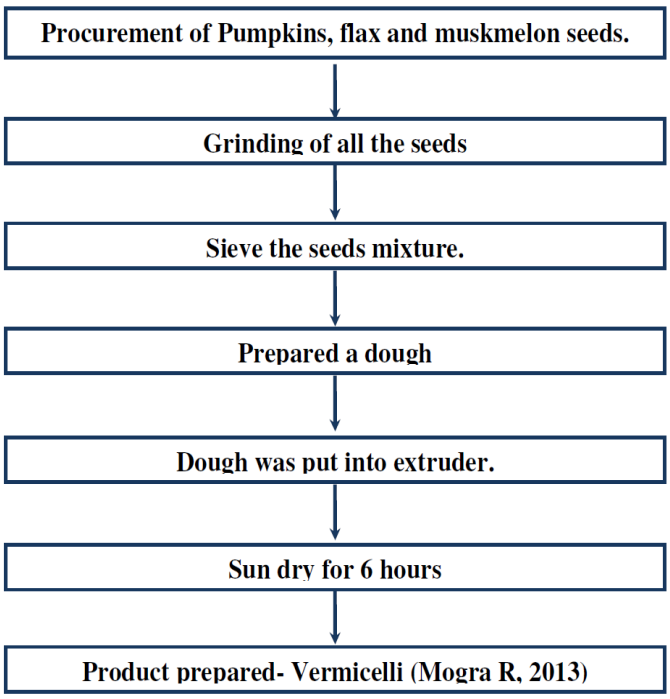
Preparation of vermicelli

In this four samples were prepared. Sample A,B,C,D, sample A was control sample prepared by semolina and wheat flour in the ratio (50:50) and water added into it to make a dough. The mixture was put into the extruder. It was made to sun dry for six hours. Sample B was in which pumpkin seeds flour was added along with semolina and wheat flour ratio (40:40:20), Sample C – flax seed flour along with wheat flour and semolina in the ratio (40:40:20), sample D - muskmelon seed flour along with wheat flour and semolina ratio (40:40:20). 30 untrained members using five-point hedonic scale carried out sensory evaluation. 5 parameters were used in this, that is color and appearance, texture, flavor, order and overall acceptability. Proximate analysis was done for the most acceptable muffin and vermicelli by AOAC method and also the shelf life of muffin was analyzed by standard plate count (Barbu *et al.,* 2018) to check the number of yeast and mold.

FLOW CHART OF MUFFIN.



FLOW CHART OF VERMICELLI



RESULT AND DISCUSSION

The present study was done to evaluate the nutritional quality of seeds (pumpkin seeds flaxseed and muskmelon seeds). By using these seeds, muffin and vermicelli was prepared and then subjected it to sensory evaluation. The proximate analysis was done for the most acceptable product that is muffin, vermicelli and shelf life of the muffin.

Result and discussion are presented in three steps:

1- Sensory evaluation of the product 2- Proximate analysis of Most acceptable muffin and vermicelli. 3- shelf life of muffin.

Table 1 : Sensory Evaluation Mean score of Different seeds enriched muffin

Parameters	Sample A	Sample B	Sample C	Sample D
Appearence	5±0.80	4.1±0.80	3.8±0.89	4.1±0.78
Flavour	4±0.68	4.1±0.85	3.6±1.0	4.3±0.64
Texture	4±0.77	3.8±0.96	3.7±0.9	3.9±0.87
Odour	4.1±0.80	4.03±0.75	3.5±0.99	3.9±0.86
Overall Acceptability	4.2±0.91	4.1±0.68	3.6±0.94	4.5±0.76

1. Sensory Evaluation - Sensory evaluation was done by 5 point hedonic scale by the 30 untrained panelists and these panelists were choosen from the college campus. These panelist were asked to analyze the sample on the basis of appearance, flavor, texture, odour and overall acceptability.

The sample were described as-

MUFFIN

Sample A – Control sample

Sample B- Pumpkin seed flour + oats flour

Sample C – Flaxseed flour + oats flour

Sample D – Muskmelon seed flour + oats flour

Muffin Sensory Evaluation

In the sensory evaluation of muffin the overall acceptability was observed in sample D i.e. Muskmelon seed Flour + Oats Flour (4.5 ±0.76) and the least acceptability was observed Sample C Flaxseed Flour + Oats Flour (3.6±0.96)

In terms of appearance the highest score was obtained in sample B and sample D i.e. (4.1±0.80) or (4.1±0.7) and the less values were observed in Sample C i.e. (3.8±0.89). So the results was statistically significant.

In terms of texture the highest value were observed in Sample D which is muskmelon seeds flour (4.3±0.64) and the average values were observed in Sample A and Sample B

i.e.(4±0.64) and (4.1±0.85). However, least observed in Sample C (3.6±1.0)

Odour Parameters showed highest value in Sample B i.e. (4.3±0.75) and the least observed in sample C (3.9±0.99) so the result was statistically significant.

Overall acceptability of sensory scores of muffin showed that sample D was overall acceptable which contains Muskmelon seeds and the sample c was least acceptable which contains Flax seeds. The result obtained was statistically significant.

Table 2 : Sensory Evaluation mean score of different seeds incorporated vermicelli

Parameters	Sample A	Sample B	Sample C	Sample D
Appearance	3.9±0.87	4±0.6	4±0.1	3.4±0.91
Flavour	3.8±0.7	4.3±0.47	4.5±0.6	3.5±0.80
Texture	3.6±0.9	4.3±0.4	4.3±0.56	3.5±0.49
Odour	3.8±0.8	4.4±0.49	4.5±0.1	3.6±070
Overall Acceptability	3.7±0.8	4.3±0.47	4.5±0.1	3.6±0.70

VERMICELLI

Sample A – Control sample

Sample B – Pumpkin seeds flour+Semolina+wheat flour

Sample C – Flaxseed flour + semolina + wheat flour

Sample D – Muskmelon seeds + semolina+ wheat flour

Sensory evaluation of Vermicelli

In the sensory evaluation of muffin the overall acceptability was observed in sample B i.e. Pumpkin Seed Flour + Wheat Flour + Semolina (4.3±0.75) and the least acceptability was observed Sample C Flaxseed Flour + Oats Flour (3.1 ±0.1)

In terms of appearance the highest score was obtained in sample B i.e. (4.1±0.6) or and the less values were observed in Sample C i.e. (2.7 ±0.1). So the results was statistically significant.

In terms of texture the highest value were observed in Sample B which is Pumpkin seed flour (4.3±0.4) and the lower values were observed in Sample C (However, least observed in Sample C (2.5±0.56)

Odour Parameters showed highest value in Sample B i.e. (4.4±0.49) and the least observed in sample C (2.9±0.1) so the result was statistically significant.

Overall acceptability of sensory scores of muffin showed that sample C was overall acceptable which contains flax seeds and the sample D was least acceptable which contains Musk melon seeds. The result obtained was statistically significant.

Table 3: Proximate analysis of most acceptable muffin

Parameters	Raw Ingredients (Musk Melon Seeds Muffin)	Cooked Form (Musk Melon Seeds Muffin)
Energy	324.9 Kcal	459.6 Kcal
Protein	10.0gm	12.35gm
Fat	11.89gm	13.90gm
Carbohydrate	39.01gm	71.29gm
Dietary Fibre	7.64gm	6.92gm

Energy content of the muffin samples showed that energy value was increased in cooked form of muffin in comparison to raw form of muffin. It was found that raw form contain 324.9 kcal and cooked form contain 459.6kcal which was higher than the raw form of musk melon seeds muffin

Protein content was found to be higher in cooked form than the raw form. The values are represented as raw form have 10.0 gm of protein and cooked form have 12.35 gm of protein. So the result was quite significant in terms of proximate analysis of protein.

Carbohydrate content of the pumpkin seeds incorporated muffin was higher in cooked form of muffin than the raw form of flax seeds muffin. The values of carbohydrate was represented as raw form contain 39.01gm and cooked have 71.29gm. This was showed that the values was much higher than the raw ingredients.

Fat content of the pumpkin seeds muffin was found to be higher in cooked form of musk melon seeds enriched muffin. Result showed that 11.89gm of fat was present in raw form of muffin and 13.90gm of fat was present in cooked form.

Dietary fibre results showed that raw form contain more amount of dietary fibre than the cooked form of muffin. Values were represented as raw form contain 7.64 gm of dietary fibre and cooked form of muffin contain 6.92gm of dietary fibre.

Table 4: Proximate analysis of most acceptable vermicelli

Parameters	Raw Ingredients (Flax Seeds Enriched Vermicelli)	Cooked Form (Flax Seeds Enriched Vermicelli)
Energy	315.5Kcal	407.6 Kcal
Protein	8gm	9.3-9gm
Fat	1.2gm	18.78gm
Carbohydrate	40gm	50.26gm
Dietary Fibre	5.46gm	6.30gm

Proximate analysis of vermicelli showed that energy value of raw ingredients of muskmelon seed incorporated vermicelli was found to be lower than the cooked form of muskmelon seeds enriched vermicelli. The value of vermicelli indicates that raw form have 315.5 kcal of energy and cooked form of vermicelli have 407.6 kcal

Protein content showed that raw ingredients have more protein than the cooked form of vermicelli. Raw ingredients have 8 gm of protein and cooked form of vermicelli have 9-9.3 gm of protein This lowering of protein value may be due to the loss of protein during cooking process.

Carbohydrate content was found to be higher in raw ingredients than the cooked form i.e. raw form have 40gm of carbohydrate and cooked form of vermicelli have 50.26gm

Fat content was found to be higher in cooked form of vermicelli which was enriched in muskmelon seeds in comparison to control sample. Values were represented as raw form have 1.2gm of fat and cooked form have 18.78 gm of fat.

Dietary fibre was found to be ;low in cooked form than the raw form of vermicelli i.e. raw form have 5.46gm of dietary fibre and cooked from have 6.30gm of dietary fibre.

3. Shelf life-

Table 5 : Shelf life of pumpkin seeds incorporated muffin on 5^{th} day

Parameters	Flax Seeds Muffin
Total Plate Count	23250 cfu/gm
Yeast And Mold Count	707.5 cfu/gm
Coliform Count	Absent
Salmonella Count	Absent

Total plate count of pumpkin seeds incorporated muffin showed that the total plate count was 23250 cfu/gm which was in acceptable range. It was observed that the microbial count was found to be very low on fifth day of storage. Yeast and mold count on fifth day in pumpkin seeds incorporated muffin was 707.5 cfu/gm which was found low than the maximum limit. So it was acceptable till fifth day. Coliform count was found to be nil in pumpkin seeds enriched muffin. Salmonella growth was also found to be nil.

Table 6 : Analysis of muffin on 10^{th} day

Parameters	Musk Melon Seeds Muffin
Total Plate Count	51590 cfu/gm
Yeast And Mold Count	1164.5 cfu/gm
Coliform Count	Absent
Salmonella Count	Absent

Standard plate count in pumpkin seeds incorporated muffin was 51,590 cfu/gm on 10^{th} day of storage which was more than the maximum limit which showed that the muffin sample was spoiled due to increase growth of microorganisms in the muffin. after that in yeast and mold count it was observed that on 10^{th} day of shelf analysis it was increased over the maximum range which indicates that the sample was spoiled on 10^{th} day. Other than this coliform count and salmonella count was found to be absent till tenth day of spoilage.

CONCLUSION

On sensory evaluation, the sample D which was muskmelon seed flour and oats flour in the ratio (40:20) volume was most acceptable and sample C, flaxseed flour and oats flour in the ratio (40:20) was least acceptable. In vermicelli, sample C (wheat flour + semolina + flaxseed flour) was most acceptable and sample D (wheat flour + semolina + muskmelon seed flour was least acceptable). On 10^{th} day the standard plate count yeast and mold count was increased so due to which muffin was spoiled because of the growth of the microorganism. So the shelf life of the muffin was up to five days.

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