J. Food and Dairy Sci., Mansoura Univ., Vol. 3 (1): 1 - 10, 2012

IMPROVEMENT THE NUTRITIONAL VALUE OF BALADY BREAD BY USING FENUGREEK AND MOGHAT

El-Adly, N. A. ; A. S. I. Hussein and Amany M. A. Sakr
Food Tech. Res. Institute., Agri. Res. Center, Giza, Egypt

ABSTRACT

The objective of this study was to acsses the rheological and sensory properties of balady bread produced from wheat whole meal and that made by blending wheat flour 82 % extraction + 20% corn flour. To improve bread nutrition value was used gelatinization baking method and supplemented with fenugreek and moghat powder at 5, 10, and 15% separately. Chemical composition of raw materials, rheological properties of dough and sensory properties of bread were investigated. The results indicated that the supplemented with fenugreek and moghat powder improved rheological and sensory properties of preduced bread. Also, the staling was retarded by about 10-15%. It was found that the most effective substituation percent of fenugreek and moghat was a mixture of 5% of both fenugreek and moghat which improved the bread properties.

INRODUCTION

In developing countries malnutrition is major of morbidity and many cassis underlying factor in mortality especially among infants and young children (Gaber *et al* 2001).The dried peeled roots of G. Bruguieri (Desf) (namely; in Arabic as moghat) are used in folk medicine for the treatment of gout and spasms; and as a tonic and nutritive agent (Meselhy, 2003). Generally; in Egypt after childbirth; women have especially used hot drink of powederd moghat with some additives, i.e., spices; flavoring agents; sugars and butter as a general tonic and to stimulate in nursing mothers. Because of its high content of mucilage (up to 27 g/100 g based on dry weight) as mentioned by Karawya *et al*. (1971); moghat also prescribed as a demulcent agent. Moghat seeds containd 5% mucilage, while 15.75% -29.6% was recorded in roots. These plantparts contained rhamnose, xylose, mannose and galacturonic acid. The roots had decreasing the blood glucose level in a male. Moghat as a tonic, increases the body weight and useful as an application for bruises, gout and spasms. It is also considered to be a demulcent. The powdered roots combined with some additives are used for preparing a hot drink in winter. It is also used to stimulate uterine contractions and milk secretion in females after delivery(Ibrahim *et al* 1997). In addition to muciliage, oestrone and phytosterol, biflavones, methoxylated flavones, anthraquinones and lignans were found in moghate. These constituents exhibit a variety of biological effects. Besides sesamin which edded to moghat drink showed to be good for the liver, and has antihypertensive effects. This broad spectrum of constitueuts suggests the possible utilization of moghate as a valuable crude drug. (Nokano, *et al,* 2002)

Fenugreek (*Trigonella foenum_graceum*) is a leguminous herb cultivated in India and North African countries, has been used as a spice worldwide to enhance the sensory quality of food and also known for its

medicinal qualities (Mathur and Choudhry, 2009). Fenugreek seeds have restorative and nutritive properties and are known to stimulate digestive prcess (Shirani and Ganes Arancee, 2009). Moreover, Faeste *et al*., 2009) reported that the fenugreek is one of the oldest medicinal plants, known for its olfactory, laxative, and galactogogue effects. More recently, immunostimulatoy, antidiabetic entihypertensive and cholesterol-lowering activites have been demonstarated. For example, fenugreek may therefore be considered beneficial in the daily diet, as a condiment or supplement in bread. Adding fenugreek fiber to refined flours helps to fortify with a balance of soluble and unsoluble fiber. Flour fortified with 8-10% fenugreek fiber has been used to prepare bakery foods like pizza, bread, muffins, and cakes with acceptable sensory properties (Srinivasan, 2005).

The object of this study was to evluate balady bread produced from wheat whole meal or wheat flour 82% blended with 20% corn flour and fortified with either fenugreek or moghate (roots) powder for its chemical composition, rheological and sensory properties compared with control (wheat flour 82% extraction only).

MATERIALS AND METHODS

Materials:-

1- Wheat seeds (*triticum aestivium L*.), cultivar Sakha 69 were obtained from field crops

Research Institute, Agric. Res. Center, Giza, Egypt. The wheat seeds were milled in a junior laboratory mill to a fine powder. A part of the whole meal was passed through different sieves to give bran and wheat flour extraction 82%. Corn flour was obtained from the Egyptian and Italian company for corn products, 10th Ramadan City Egypt.

2 - The tested fenugreek powder and moghat powder were obtained from local market.

3- The compressed bakery yeast was purchased from Starch and Yeast Company Alexandr Egypt.

Methods:-

Chemical analysis of raw materials and produced bread:

Moisture, protein, ash, fat, and crude fiber were determined according to the method described in A.O.A.C. (2002). While total carbohydrate were calculated by difference

Rheological properties were determined by Brabender farinograph according to the methods outlined in the AACC (2002).

Gelainization baking method:-

Corn flour was separately mixed with equal amount of wheat flour in mixing bowl. Boiled water (40% v/w) was added to a part of the blend mixed for 3 min. added the remained amount of wheat flour and salt. During mixing time or when the fermentation dough become warm, continue as described in traditional method to bulk dividing, flatted, fermentation and baking at 450-500ºc in mechanical natural gas oven for 60-90 sec and cooled after baking. (Abd el Rahim 2005).

Staling: The staling rate of the produced balady bread was determined at zero time of baking and after 24 and 48 hours by using alkaline water retation capacity (AWRC) method according to Yamazaki (1953). modified by Kitterman and Rubenthaler (1971). In this method the percentage of the absorbed alkaline solution ($NaHCO_3$) to 5 gram of bread was calculated.

Sensory evaluation of balady bread:-

Each formula the balady bread was organoloptically evaluated by ten panelists according to Faridi and Rubethaller (1984) and Gelinas *et al* (1995).

Statistical analysis:

All determination triplicated and mean values and standard deviations reported. Analyses of variance (ANOVA) were achieved to calculate significant differences in treatment means.

RESULTS AND DISCUSSION

Data presented in Table (1) decleard that Fenugreek powder contained the highest protein value (33.4%) followed by wheat whole flour (14.8%) while moghat powder show lowest protein content (5.8%). On the other hand, the data also reveald that moghat powder contained the highest amount of crude fiber. However Fenugreek powder contained the highest level of crude fat (5.45%).The present data are in accordance with those reported by Nokano *et al* (2002). Also, the data in (Table 1) indicate that fenugreek powder contained the highest amount of Fe (32mg/100g) and Zn (5.6mg/100g) while, moghate powder recorded the highest amount of Ca (350mg/100g) , K (461mg/100g) and Mg (398mg/100g). These results are in line with these reported by Nasra (2009) who found that. Sun- dried peeled roots of G.bruguieri plant is a good source for minerals such as calcium, magnesium and iron. She also reported that the oil is highly unsaturated with about 80% oleic and linolic acids and high content of palmitic acids. The amino acid profile shows that a spartic acid is the dominant one, consisting of about 50% of the total amino acids. The roots protein is in complete protein with low levels of essential amino acids. Ibrahime *et al* (1997) found that the moghat roots contain high levels of non starch poly sacchrides including dietary fiber, pectin and mucilage which promate the moghat drink to be a healthy functional food drink.

Table (1): Chemical composition and minerals of the Raw material (on dry weigh basis)

Row material	Crude Protein %	Crude Fat %	Ash %	Crude Fiber %	Carbohydrate %	Minerals (mg/ 100g)							
						Zn	Fe	Ca	K	Na	Mg	Mn	Cu
Wheat whole flour	14.80	2.20	1.60	2.35	79.05	4.15	5.10	75.11	233.10	130.00	308.30	30.30	6.30
Wheat flour 82% extraction	12.60	2.01	1.04	1.23	83.03	3.91	2.10	16.70	149.30	4.80	153.50	2.11	0.43
Corn flour	10.70	4.10	1.40	1.70	82.10	3.60	1.81	15.90	140.00	4.10	114.20	1.30	0.28
Fenugreek powder	33.40	5.45	3.60	8.20	49.35	5.60	32.00	22.90	135.10	507.00	160.10	4.14	1.80
Moghat powder	5.80	5.10	5.20	10.80	73.10	2.40	3.50	350.00	461.00	71.00	398.00	1.70	0.16

Effect of supplemented with fenugreek and moghat on dough reological properties:

Water absorption gradually increased by increasing the substitution percentage to15% fenugreek and moghat treatments had higher water absorptions than other treatments as presented in table (2) and table (3), However, the stability time increased by increasing the substitution percentage to15% femugreek or moghat, while the highest stability time resulted in control (1) than other treatments. This means that the mucilage or the high protein content found in moghate or fenugreek affect the raeologecal properties of the dough which followed by bread with some exchangeable comparet with control .These results were in agreement with Zaidul *et al* (2004).

Table (2): Rheological properties (farinograbh parameters) of wheat whole meal supplemented with Fenugreek or Moghat.

Ttreatments	Water abs. %	Devel op. Time (min)	Stability (min)	Arrival time (min)	Degree of weak (BU)
Control (1)	65.8	2.0	4.0	1.2	100
Control (2)	71.4	2.5	2.5	1.5	120
Treatment (1)	72.4	2.5	3.0	1.5	100
Treatment (2)	72.3	2.2	3.5	1.2	100
Treatment (3)	73.4	2.2	3.5	1.2	90
Treatment (4)	74.1	2.5	2.5	1.5	100
Treatment (5)	74.6	2.5	3.0	1.3	90
Treatment (6)	75.2	2.5	3.0	1.3	90
Treatment(7)	73.3	2.2	3.5	1.3	90

Control (1): wheat flour 82% extraction.
Control (2): wheat whole meal. **Treatments (1) Control (2) + Fen. 5 %**
Treatment (2): Control (2) + Fen.10 %. **treatment (3): Control (2) + Fen 15 %.**
Treatment (4): Control (2) + Mog.5 %. **Treatment (5): Control (2)+ Mog. 10 %**
Treatment (6) : Control (2)+ Mog. 15 % . **Treatment (7) : Control (2)+ Fen 5%+Mog 5%.**
***R.D.: Reduce of decrease**

Table (3): Rheological properties (farinograbh parameters) of wheat flour 82% extraction blended with 20% corn flour and supplemented with fenugreek or moghat.

Ttreatments	Water abs. %	Devel op. Time(min)	Stability (min)	Arrival time (min)	Degree of weak (BU)
Control (1)	65.8	2.0	4.0	1.2	100
Control (2)	72.1	2.5	2.5	1.5	120
Treatment (1)	73.4	2.0	3.0	1.3	100
Treatment (2)	73.8	2.2	3.5	1.3	90
Treatment (3)	79.1	2.5	3.5	1.3	90
Treatment (4)	73.0	2.2	3.0	1.5	100
Treatment (5)	73.2	2.5	3.0	1.3	100
Treatment (6)	73.3	2.5	3.5	1.3	100
Treatment(7)	72.3	2.2	3.0	1.3	90

Control (1): wheat flour 82% extraction. **Control (2): wheat whole meal.**
Treatments (1) Control (2) + Fen. 5 % **Treatment (2): Control (2) + Fen.10 %.**
treatment (3): Control (2) + Fen 15 %.
Treatment (4): Control (2) + Mog.5 %.
Treatment (5): Control (2)+ Mog. 10 %
Treatment (6) : Control (2)+ Mog. 15 % .
Treatment (7) : Control (2)+ Fen 5%+Mog 5%.
***R.D.: Reduce of decrease**

Chemical composition of supplemented balady bread:

Results were given in Table (4) show the chemical composition of balady bread supplemented with fenugreek or moghat powder. The data revealed that an increase in protein, crude fiber, ash and fat due to supplementation by fenugreek and moghat to wheat flour 82% extraction + 20% corn flour or wheat whole meal. Also Table (5) resulted in an increase in all nutrients of produced bread compared with bread produced from wheat flour 82% extraction.

Table (4): chemical composition of balady bread produced from wheat flour 82% extraction blended with 20% corn flour and supplemented with Fenugreek or Moghat

Ttreatments	Fortification level%	Crude protein %	Crude Fat %	Ash %	Crude Fiber %
Control (1)	0 %	13.01	1.43	1.04	1.16
Control (2)	0 %	12.61	2.40	1.05	1.30
Treatment (1)	5 %	16.06	2.61	1.16	1.66
Treatment (2)	10 %	17.97	2.87	1.40	2.36
Treatment (3)	15 %	19.86	3.29	1.51	2.82
Treatment (4)	5 %	14.45	2.59	1.39	1.80
Treatment (5)	10 %	14.30	2.91	1.53	2.11
Treatment (6)	15 %	14.10	3.13	1.89	2.50
Treatment(7)	5 % + 5 %	15.00	2.88	1.43	2.10

Control (1): wheat flour 82% extraction.
Control (2): wheat whole meal.
Treatments (1) Control (2) + Fen. 5 %
Treatment (2): Control (2) + Fen.10 %.
treatment (3): Control (2) + Fen 15 %.
Treatment (4): Control (2) + Mog.5 %.
Treatment (5): Control (2)+ Mog. 10 %
Treatment (6) : Control (2)+ Mog. 15 % .
Treatment (7) : Control (2)+ Fen 5%+Mog 5%.
***R.D.: Reduce of decrease**

Table (5): Chemical composition of balady bread Produced from wheat whole meal supplemented with fenugreek or moghat.

Blends (treatments)	Fortification level %	Crude Protein %	Crude Fat %	Ash %	Crude Fiber %
Control (1)	0 %	13.01	1.43	1.05	1.16
Control (2)	0 %	14.80	2.20	1.60	2.35
Treatment (1)	5 %	16.35	2.46	1.75	2.60
Treatment (2)	10 %	18.30	2.71	1.91	3.10
Treatment (3)	15 %	19.60	3.00	2.00	3.40
Treatment (4)	5 %	14.20	2.41	1.70	2.70
Treatment (5)	10 %	13.60	2.66	2.00	3.28
Treatment (6)	15 %	13.00	3.00	2.30	3.80
Treatment(7)	5 % + 5 %	16.80	2.68	2.00	3.10

Control (1): wheat flour 82% extraction.
Control (2): wheat whole meal.
Treatments (1) Control (2) + Fen. 5 %
Treatment (2): Control (2) + Fen.10 %.
treatment (3): Control (2) + Fen 15 %.
Treatment (4): Control (2) + Mog.5 %.
Treatment (5): Control (2)+ Mog. 10 %
Treatment (6) : Control (2)+ Mog. 15 % .
Treatment (7) : Control (2)+ Fen 5%+Mog 5%.
***R.D.: Reduce of decrease**

Supplementation of bread with 5, 10 and 15 of fenugreek or moghat powder caused an increase in its protein content to 16.06 ,17.97 , 19.86 % for fenuugreek 14.45 , 14.30 , 14.10 % for moghat and 15 % due to supplementation with 5% fenugreek and 5% moghat) respectively. These results are in agreement with these reported by Nasra (2009).

The addition of fenugreek and moghat powder to wheat whole meal Table (5) as supplemented materials (5, 10, and 15%) to wheat flour resulted in an increase in the protein values to (16.35, 18.3, 19.6 for fenugreek 14.2, 13.6, 13 for moghat and 16.8%) for the mixture of 5% fenugreek and 5% moghat) respectively, compared with balady bread produced from wheat flour 82% extraction (control). It could be mentioned that supplementation with either fenugreek or moghat increased all chemical composition of produced bread. These results are in agreement with these reported by Hussein *et al* (2002).

Sensory evaluation of balady bread:

The sensory characteristics, i e general appearance, loaf rising, crust quality, crust color crumb uniformity, crumb color, oder, taste and overall acceptability for balady bread made from wheat flour 82% extraction + 20% corn flour and that from wheat whole meal (Table 6,7) containing different levels of fenugreek and moghat (5, 10 and 15%) were evaluated by ten panelists. From the obtained data as shown in Table (6) and Table (7). It could be noticed that substitution of fenugreek and moghat to wheat whole meal . Table (6) and wheat flour82% extration + 20% corn flour (Table 7) until 10% (5% fengreek + 5% moghat) led to produce very good balady bread for all the evaluated characterisitics than other treatment.

This was about the same as balady bread produced from wheat flour 82% extraction (control 1). These results were in agreement with Hussain *et al* (2002).

Effect of supplementation with Fenugreek and Moghat on bread stalling

The results of balady bread staling are shown in Table (8) and Table (9). It could be noticed that alkalin water retention capacity (A.W.R.C) of control (1) and control (2) balady bread and all tratment were decreased as storage period of balady bread was increased. The results indicated that substitution of fenugreek and moghat at levels 5,10, and 15% to wheat flour 82% + 20% corn flour and wheat whole meal Table (8) and (Table 9) after 24hrs and 48hrs, cased improving in swelling power and the rate of decrease comparing with control (l) , and control (2) . Such improvment may be due to the transformation of α- amylose which has a high water capacity compared to β- amyl opectin which is able to bind considerably less amount of water (Hussein *et al* 2009). Improvement in staling rate essentially due to the amylose and amylopectin zones and the change in the starch content in bread crumb, created on ordered structure and that reorgonization of intragramular amylose increased starch granule rigidly on staling of bread, (Pablo and Alain, 2007). The best imroving decreasing rate was recorded for balady bread produced from a mixture of 5% fenugreek and 5% moghat bread followed by whole wheat meal Table(8) and wheat flour 82% and 20% corn flour Table (9) , these results in agreements with Nokano *et al* (2002).

J. Food and Dairy Sci., Mansoura Univ., Vol. 3 (1), January, 2012

6-7

Table (8): Effect of supplemention with fenugreek or moghat on alkalin water relation capacity (A.W.R.C.) values of balady bread produced from wheat whole meal.

Treatments	Alkaline water relation capacity (A.W.R.C.)				
	Fresh zero time	After 24 hr		After 48 hr	
	%	%	*R.D. %	%	*R.D. %
Control (1)	350	301	14.00	252	28.00
Control (2)	362	310	14.36	261	27.62
Treatment (1)	370	330	10.81	285	22.90
Treatment (2)	373	340	8.84	300	19.57
Treatment (3)	381	355	6.82	329	13.64
Treatment (4)	376	339	9.84	299	20.47
Treatment (5)	379	356	6.06	330	12.92
Treatment (6)	389	367	5.65	340	12.59
Treatment(7)	383	364	4.96	349	8.87

Control (1): wheat flour 82% extraction.
Control (2): wheat whole meal.
Treatments (1) Control (2) + Fen. 5 %
Treatment (2): Control (2) + Fen.10 %.
treatment (3): Control (2) + Fen 15 %.
Treatment (4): Control (2) + Mog.5 %.
Treatment (5): Control (2)+ Mog. 10 %
Treatment (6) : Control (2)+ Mog. 15 % .
Treatment (7) : Control (2)+ Fen 5%+Mog 5%.
***R.D.: Reduce of decrease**

Table (9): Effect of supplementatw with fenugreek or Moghat on alkalin water relation capacity (A.W.R.C.) values of balady bread produced from wheat flour 82% extraction + 20% corn flour.

Treatments	Alkaline water relation capacity (A.W.R.C.)				
	Fresh zero time	After 24 hr		After 48 hr	
	%	%	R.D. %	%	R.D. %
Control (1)					
Control (2)	350	301	14.00	252	28.00
Treatment (1)	280	210	25.00	142	49.28
Treatment (2)	292	243	16.78	192	34.24
Treatment (3)	305	262	14.09	220	27.68
Treatment (4)	323	288	10.83	247	23.52
Treatment (5)	290	255	12.06	219	24.48
Treatment (6)	310	280	9.67	251	19.03
Treatment(7)	322	300	6.83	279	13.35
	312	281	9.93	252	19.23

Control (1): wheat flour 82% extraction.
Control (2): wheat whole meal.
Treatments (1) Control (2) + Fen. 5 %
Treatment (2): Control (2) + Fen.10 %.
treatment (3): Control (2) + Fen 15 %.
Treatment (4): Control (2) + Mog.5 %.
Treatment (5): Control (2)+ Mog. 10 %
Treatment (6) : Control (2)+ Mog. 15 % .
Treatment (7) : Control (2)+ Fen 5%+Mog 5%.
***R.D.: Reduce of decrea**

Conclusion

From the mentioned results it could be concluded that, the good substitution level of wheat flour 82% extraction+ 20% corn flour and wheat

whole flour by fenugreek and moghat powder improve the reological, sensory evaluation, stalling properties, and increased the nutrition value compared with control (1) balady bread produced from wheat flour 82% extraction and control (2) balady bread produced from wheat whole meal or wheat flour 82% extraction + 20% corn flour was a mixture of 5% of both.

REFERENCES

A.A.C.C.(2002). Appoved methods of American Association of Cereal Chmists Published by American Association, st. Paul, M. N. USA.

A.O.A.C. (2002). Official Methods of Analysis Association, of official analytical Chemists., (17thed.), Gaither bury, Maryland. USA

Abd-el Rahim, E. A. (2005). Effect of baking process on the quality of flat bread prepared from some cereal flour blends. Egyptian J. of Nutrition Vol. xxN01. 179 - 194.

Faests, C.K., Namork, E. and Lindvik, H. (2009). Allergenicity and antigenicity of fenugreek (*Trigonella foenum-graecum*) proteins in foods. Journal of Allergy Clinical and Immunology, 123(1):187-194.

Faridi, H. A. and Rubenthaler, G.L. (1984). Effect of baking time and temperature on bread quality, starch gelatinization and staling of Egyptian balady bread. Cereal Chem. 61(2): 151.

Gaber, E. M.; Gaber, F. A. and Hussein, A. S. (2001). Biological effect of fortified bread with different protein concentrates on Experimental animals. Zagazig J. Agric. Res., 28 (2) 439-456.

Gelinas, P.; Audet, J.; Lachance, O. and Vachon, M. (1995). Fermented dietary ingredients for bread: effects on dough reology and bread characteristics. Cereal Chem. 72 (3): 151-154.

Hussein, A.S.I.; Ramadan, B.R. and Serour, M.A.H. (2002). Biochemical and Nutritional Evaluation of Egyptian balady bread fortified with Iron, protein and β-carotene Rich sources Minia of Agric. Res, Develop. Vol. (22) No. 4 pp 319-336.

Hussein, A.S.I.; Shams S. R.; omaiama and N. A. El-adly, (2009). Effect of modified corn and Barely flour on balady bread. Egypt J. of Appl. Sci 24 (68) 631-639.

Ibrahim, N.; El-Eraky, W.; El- Genaihr, S.; Shalaly, A. S.; (1997).Chemical and biological evaluation of proteins and mucilages from roots and seeds of Glossostemon bruguieri Desf. (Moghat). Plant- Foods- For-Human Nutrtion. 50 (1) : 55- 61.

Karawya, M.S; Balbaa, S. I; and Afifi, S.A. (1971). Investigation of the crbtohydrate contants of certain mucilaginous plants. Planta Med 20. 14-23.crossRef. PubMed. Chemport. Web of Science Times Cited.11

Kitterman,S. and Rubenthaler, G.L. (1971). Assessing the quality of early generation wheat selection with the micro A.W.R.C.test. Ceral Sci. Today., 16:313.

Mathur, P. and Choudhry, M. (2009). Consumption pattern of fenugreek seeds in Rajasthani families. Journal of Human Ecology, 25 (1) : 9-12

Meselhy, M. S. 2003. Constituents from Moghat, the roots of Glossostemon bruguieri (desf.). Molecules 8, 614-621. crossRef. Chemport. Web of Science Times Cited 11

Nasra, A.M.A. (2009). Chemical and biological evaluation of whole wheat flour bread. D.PH in food science and Tech. Faculty of Agriculture, Cairo University.

Nokano, D.; Itsh, C.; Tokoska, M.; Kiso, Y.; Tanaka, T. and Matsumura, Y. (2002). Antihypertensive effect of sesamin. IV. Inhibition of vascular superoxide production by sesamin. Biol. Pharm. Bull 25, 1247-1249.

Pablo, D.R. and Alain, L.B. (2007). Thermo-Physical assessment of bread during staling. Food science and technology, 18: 879-884.

Shirani, G. And Ganes Arancee, R. (2009). Extruded praducts with Fenugreek chick pea and rice physical properties, sensory acceptability and glycaemic in dex. Journal of Food Engineering 90: 44-52.

Srinivasan, K.; (2005). Role of spices beyond food favoring: Nutraceuticals with multiple health effects. Food Reviews International 21: 167-188.

Yamazaki, W. T. (1953). Alkaline water retention capacity test for the evaluation of cooking baking patenti abtis of soft winter wheat flour .Cereal Chem. 30: 240.

Zaindul, I. M.: Abd el-Karim, A.; Manan, D.; Ariffin, A.; Narulain, N. N.;and Omar, A. M. (2004). Afarinograph study on the vis coelastic properties of sago / wheat flour dough systems. Journal of the Science of Agriculture, 84: 616-622.

تحسين القيمه الغذائيه للعيش البلدى بأستخدام المغات والحلبه

نبيل عبد الفتاح العدلى ، عبد الله سعيد إمام حسين و أمانى محمد عبد المنصف صقر
معهد بحوث تكنولوجيا الاغذيه – مركز البحوث الزراعيه – الجيزه

تهدف هذه الدراسه إلى تقييم الخواص الكيميائه و الريولوجيه و الحسيه للخبز البلدى المصرى المصنع من دقيق القمح الناتج من الحبه الكامله وأيضا (دقيق القمح ٨٢% إستخلاص + ٢٠% دقيق الذره). و لتقييم و تحسين هذا الخبز ريولوجيا و حسيا و رفع قيمته الغذائيه ليقارب فى صفاته الخبز المصنع من دقيق ٨٢% إستخلاص (الكنترول) تم إضافة مطحون الحلبه و المغات بنسب ٥ ,١٠,١٥% باستبدال كلا على حدة بدقيق القمح الحبة الكاملة و أيضا بالمخلوط من دقيق القمح استخلاص ٨٢% +٢٠% دقيق ذره وتمت عمليه الخبيز بطريقه الجلتنه لإنتاج خبز جيد . تم تقدير التركيب الكيميائى للمواد الخام وكذلك الصفات الريولوجيه والحسيه للخبز الناتج و أوضحت النتائج وجود تحسن ملحوظ فى كلا من الصفات الريولوجيه و الحسيه كما أظهرت النتائج تأخر عمليه البيات عند إضافه ١٠, ١٥% من مطحون الحلبه و المغات كلا على حدة. وكانت أحسن نسبه إضافه ٥% حلبه + ٥% مغات .

قام بتحكيم البحث

أ.د / محمد طه شلبى — **كلية الزراعة – جامعة المنصورة**
أ.د / احمد السيد بسيونى — **مركز البحوث الزراعيه**

Table (6): Sensory evaluation of different formula of balady bread produced from wheat whole meal using gelatinzation baking method.

Treatment	Loaf rising	Crust quality	Crust color	Crumb um	Crumb color	Oder	Tast	Over all acceptability
Control (1)	8.00 ±0.26 ^{a}	8.00±0.13 ^{ab}	8.50±0.13 ^{a}	8.00±0.26 ^{abc}	23.00±0.13 a	9.00±0.13 ^{a}	23.50±0.20 ^{a}	88.00±0.52 ^{a}
Control (2)	7.00±0.26 ^{b}	7.50±0.13 ^{b}	7.50±0.26 ^{b}	7.00±0.13 ^{d}	21.00±0.52 b	7.50±0.26 ^{c}	21.50±0.13 ^{c}	79.00±0.26 ^{d}
Treatment (1)	7.55±0.14 ^{ab}	7.70±0.55 ^{ab}	8.05±0.14 ^{ab}	7.20±0.55 ^{cd}	22.55±0.14 a	8.10±0.28 ^{b}	22.20±0.55 ^{abc}	82.35±0.42 ^{c}
Treatment (2)	7.45±0.14 ^{b}	8.01±0.28 ^{ab}	8.55±0.14 ^{a}	7.90±0.28 ^{abc}	22.5±0.14 a	8.55±0.14 ^{ab}	22.30±0.55 ^{abc}	85.55±0.14 ^{b}
Treatment (3)	7.60±0.28 ^{ab}	7.55±0.14 ^{b}	8.55±0.14 ^{a}	7.90±0.28 ^{abc}	22.45±0.14 a	8.45±0.14 ^{ab}	23.20±0.55 ^{ab}	85.60±0.28 ^{b}
Treatment (4)	6.90±0.28 ^{b}	7.45±0.14 ^{b}	8.05±0.14 ^{ab}	7.45±0.14 ^{bcd}	22.20±0.55 a	8.10±0.28 ^{b}	22.05±0.14 ^{bc}	82.20±0.55 ^{c}
Treatment (5)	7.60±0.28 ^{ab}	8.05±0.14 ^{ab}	8.05±0.14 ^{ab}	8.01±0.28 ^{ab}	22.70±0.55 a	8.45±0.14 ^{ab}	23.20±0.55 ^{ab}	85.70±0.55 ^{b}
Treatment (6)	7.60±0.28 ^{ab}	8.05±0.14 ^{ab}	8.10±0.25 ^{ab}	8.05±0.14 ^{abc}	22.55±0.14 a	8.45±0.14 ^{ab}	23.20±0.55 ^{ab}	85.65±0.42 ^{b}
Treatment(7)	8.10±0.28 ^{a}	8.45±0.14 ^{a}	8.60±0.28 ^{a}	8.45±0.14 ^{a}	22.05±0.14 ^{a}	8.05±0.11 ^{b}	23.45±0.14 ^{a}	84.57±0.31 ^{a}

Control (1): wheat flour 82% extraction. **Control (2): wheat whole meal.**
Treatments (1) Control (2) + Fen. 5 % **Treatment (2): Control (2) + Fen.10 %.**
treatment (3): Control (2) + Fen 15 %. **Treatment (4): Control (2) + Mog.5 %.**
Treatment (5): Control (2)+ Mog. 10 % **Treatment (6) : Control (2)+ Mog. 15 % .**
Treatment (7) : Control (2)+ Fen 5%+Mog 5%.
***R.D.: Reduce of decrease**

Table (7): Sensory evaluation of different formula of balady bread produced from wheat flour 82% extraction + 20% corn flour using gelatization baking method.

Treatment	Loaf rising	Crust quality	Crust color	Crumb um	Crumb color	Oder	Tast	Over all acceptability
Control (1)	8.01±0.28 ^{a}	8.10±0.27 ^{a}	8.10±0.28 ^{a}	23.10±0.28 ^{ab}	23.10±0.28 ^{a}	9.05±0.14 ^{a}	23.45±0.14 ^{a}	88.20±0.55 ^{a}
Control (2)	7.10±0.28 ^{b}	6.95±0.14 ^{c}	6.95±0.14 ^{c}	19.95±0.14 ^{c}	19.95±0.14 ^{d}	7.55±0.14 ^{c}	21.35±0.42 ^{d}	76.70±0.83 ^{e}
Treatment (1)	7.05±0.14 ^{b}	7.10±0.28 ^{c}	7.20±0.55 ^{ab}	22.15±0.42 ^{c}	22.15±0.42 ^{abc}	8.05±0.14 ^{bc}	21.05±0.14 ^{d}	80.10±0.25 ^{d}
Treatment (2)	7.10±0.28 ^{b}	7.45±0.14^{abc}	8.05±0.14 ^{bc}	22.45±0.14 ^{ab}	22.45±0.14 ^{ab}	8.55±0.14 ^{ab}	22.45±0.14 ^{bc}	83.05±0.14 ^{c}
Treatment (3)	7.05±0.14 ^{b}	7.05±0.14 ^{c}	8.10±0.28 ^{c}	22.70±0.55 ^{ab}	22.70±0.55 ^{a}	8.40±0.28 ^{b}	23.05±0.14 ^{abc}	83.45±0.14 ^{bc}
Treatment (4)	7.20±0.55 ^{b}	7.20±0.55 ^{bc}	7.05±0.14 ^{c}	21.55±0.14 ^{c}	21.55±0.14 ^{bc}	8.10±0.28 ^{bc}	22.20±0.55 ^{c}	79.70±0.55 ^{d}
Treatment (5)	7.05±0.14 ^{b}	7.45±0.14 ^{abc}	7.00±0.28 ^{ab}	22.55±0.14 ^{c}	22.55±0.14 $_{ab}$	8.55±0.14 ^{ab}	23.10±0.28 ^{ab}	83.45±0.14 ^{bc}
Treatment (6)	7.50±0.13 ^{ab}	8.00±0.13 ^{ab}	7.50±0.13 ^{c}	22.00±0.64 ^{bc}	22.00±0.64 ^{abc}	8.50±0.13 ^{ab}	23.00±0.13 ^{abc}	83.50±0.26 ^{bc}
Treatment(7)	8.05±0.14a	8.10±0.28 ^{a}	8.55± 0.14 ^{a}	21.10±0.28 ^{a}	21.10±0.28 ^{c}	8.10±0.28 ^{bc}	22.45±0.14 ^{bc}	84.55±0.14 ^{b}

Control (1): wheat flour 82% extraction. **Control (2): wheat whole meal.**
Treatments (1) Control (2) + Fen. 5 % **Treatment (2): Control (2) + Fen.10 %.**
treatment (3): Control (2) + Fen 15 %. **Treatment (4): Control (2) + Mog.5 %.**
Treatment (5): Control (2)+ Mog. 10 % **Treatment (6) : Control (2)+ Mog. 15 % .**
Treatment (7) : Control (2)+ Fen 5%+Mog 5%.
***R.D.: Reduce of decrease**