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Study of the effect of grani moisture and speed in some qualitative characteristics of the cultivar of wheat Ahwaze 1.

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Abstract; The experiment has been conducted to evaluate the effect grain moisture and speed in some technical indicators of wheat cultivar, Ahwaz 1, in the laboratories of the Tehran University in2015.This research includes the using of two types of machines (Cylinder and Hammer), under three moisture content levels 13-15% , 15- 17% and 17-19% , and three speed levels 0.717 , 0.820 and 0.921. The results showed that the Cylinder type machine is significantly better on the Hammer type machine in all studies traits. As well as moisture grain 13-15% is superiorly significantly on two 15-17%,17-19% levels in all studied traits .While speed 0.717 significant superiorly in two ,0.820 ,0.921 levels in all studies traits .The overlap between the machine type Cylinder and grain moisture content 13-15% superiority significantly and also overlap between the Cylinder type machine and speed 0.717 in all studied traits as compared with overlap of the Hammer type machine with grain moisture and two speeding in all studied traits. The best results have come from the triple overlap among Cylinder type machine, grain moisture 13-15%, and speed 0.717 in all studies tirats the best result with overlap 0.717 with grain moisture 13-15% and Cylinder type machine.

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Keywords: Degree of hardness, percentage of exact material, percentage of fiber, percentage of impurities,proportion of protien , percentage of bran.

Introduction:

Wheat occupies about % 80 of total planted areas in Iraq. Historical development of flour milling technology leads to the introduction of roller mills about a century ago, introducing the themes of wheat hardness, bread quality and the international grain trade that brought about modern flour milling and deminated its practice still. The initial breakage of the wheat kernels is the most critical operation in flour milling, the development of mathematical models for predict the breakage based on the distribution of kernel characteristics in the feed has been reviewed .(Bautista et al.,2002) .Revealed that the removal of bran as the milling duration and grain moisture content increased will be resulted in linear reduction of whole kernel yield.(Delcour and Hoseney, 2010).The grain has different types of anatomical components and those mostly mentioned is bran, germ and starchy endosperm , there are several more . Bran is a milling fraction that is highly enriched in a eight different layers excluding the aleurone layer. Some of the layers are the outer and inner pericarp (fruit coat), seed coat.(Mousia et al., 2004)Roller milling is a technique where the grains are grinded between two rolls that rotates in different directions at different speeds. One of the rolls has a speed 2.5 times faster than the slower one and due to the differences in speed the roll mill exposes the grains for both a crushing and a shearing force. The roller mill is commonly used, especially for grains with a crease. A set of rolls is called a break and many mills have a break system composed of several breaks which process the grains. Shearing force is ideal for getting pure flour while crushing would break the bran into too small pieces. In the beginning the grains are broken into big pieces which then are further processed. The last break flattens the grain particles and there the germ can be removed by sieving. Every break is connected to a sieving system which classifies by size and sends the particles to further grinding except the smallest partials that are saved as flour. After each break some flour is produced. The reduction system is where the endosperm gets the flour fineness and the last parts of the bran and germ are removed . It is common that some bran particles pass through to the flour. Ash content and colour of the flour are used as an indication of bran contamination in the flour.(Hemery *et al.*, 2007). Wheat is a “naked” grain, which means that the hull is separated from the grain during threshing. Wheat grains contains around 65-75% of carbohydrates, 7-12% protein, 2-6% lipids and 12-

14% water and micronutrients. Wheat is also a good source for B vitamins. There is a variation of nutrient content depending on factors such as cultivar, growing conditions and hardness of the wheat .The wheat grains are slightly oval and rounded on the germ side. Along the opposite side of the germ is a crease with a depth in to the centre. The crease makes it difficult to get pure white flour for millers and is a source for microorganisms and dust .Pericarp makes up approximately 5% of the grain while the aleurone layer makes up 6-9%. Pericarp has several cell layers and is the outermost layer of the grain. The aleurone layer belongs to the endosperm and is only one cell layer thick in wheat. The cells in the aleurone layer has thicker cell walls and contains a higher enzyme activity and has a higher content of ash, protein, B vitamins and total phosphorus. Bran has a high content of dietary fibre and approximately 30% of the fibre found in bran consists of arabinoxylan. The content of arabinoxylan in the wheat grain is about 6-7% .(Dexter and Wood, 1996).The germ is also called embryo and is the main source of oil in the wheat grain but also has a high amount of protein, sugar and ash. It also has a rather high amount of enzymes and vitamin B and E (tocopherol) .The germ is divided in two different parts, the embryonic axis and scutellum. The scutellum function as a storage organ for the root and shoot which orients from the embryonic axis. The starchy endosperm is composed of starch, which is packed in granules and storage proteins. The cell walls in the endosperm are where the dietary fibres are found and the main component is arabinoxylan with 1.5-2.5% of the endosperm. Small amounts of β-glucan are also found in the endosperm cell walls . The starchy endosperm is the substantial part of the wheat grain with 80-85% .(Singh et al, 2010).There are many different types of wheat and they vary both in size, colour and hardness. The pigment is mostly located in the seed coat of the grains and common colours are white and red. Durum wheat is a kind of wheat ultimate for pasta production, it is a hard wheat that has a high amount of the pigment carotenoid. The durum wheat is what gives the pasta the yellow colour.(Bamgboye et al 2012) The force needed to rupture a seed decreased as the moisture content increased from 5.85 to 25.85%. The rupture force of 113.99 N was the highest in the horizontal direction at 5.85% moisture content, while the least rupture force was 26.83 N at the moisture content of 28.85%.(Chung et al 2003) Explored that The comparison of milling efficiency factors between experimental results and simulation results . The differences of hulling efficiency, milling efficiency, between experiment and simulation were 0_4, 0_7, 0_4%, respectively. Although the simulation results were a little lower than experimental ones, they are close. The materials produced in the processes of simulation were compared with those in experiment.(Kunze and Calderwood, 2004; Li et al., 2003) ; Reported that these effect on grain, during harvest, kernels with both high and low moisture content are mixed.Those with high moisture content desorb moisture into the air, while grains with low moisture content adsorb moisture.(Alsharifi 2007). Mention that when moisture content of grain increasing leads to proportion of impurities and this is due to adhesion of the impurities on grain with increase of the grains moisture .(Al Saadi et al.,2010). Concluded that of the percentage of fiber , protein and exact materials more effect when moisture of grain and speed milling process increase (Aldaly,1987) mentioned that there is more factors which effect on percentage of fiber and exact materials they are moisture and speed as well as workers efficiency in milling process.(Ogunsina et al.,2007) The physical properties of Roselle seeds were found to increase as the moisture content increases with the exception of the bulk density that decreased.

Materials and methods

Experiment was carried out in the laboratory of Tehran university in season 2014-2015 which used in was two types of mills machines experiment (Cylinder and Hammer) The main factors ,under three levels of grain moisture are 13-15% , 15-17% and 17-19%.The secondary factors are three speed levels 0.717, 0.820 and 0.921 .under secondary factors, random semples of were taken wheat cultivar (Ahwaz 1) by probe and collected on form of heaps ,Number heaps six each heap weight 160kg, according to the method used by (Alshrifi et al 2007).Wheat was cleaned to remove all foreign matters, broken and immature grains using sieves.Then the random samples were taken from per heaps weight 1000gm .The initial moisture content of wheat grain was determined by oven drying methods at 103c for 48h according to the method used by (Andres et al.,2012). To obtain the desired moisture content level wheat was kept in an oven at temperature of 43c and monitored carefully for Ahwaz 1 cultivar .when for determining the moisture content of grain 17-19% then sample were taken and place in Precision divider to get a sample of weight 200gm ,the samples were carefully sealed in polythene bags. Then organization of the cylinder type machine on clearance 0.8mm and speed 0.921 . this sample which weight 200g is placed in the cylinder type machine . After taking out the sample from the machine it was placed in cylindrical insulation device from Satake type with operating time which is adjusted for 2 minut and the angle of inclination 25 degree insolate the broken and full of grain of all size.The following indicators were calculated.

Proportion of the exact material. Eq 1 (Alsiadi., 1983).

$$P_{EM}=\frac{W_{EM}}{W_S}\times 100 \quad (1)$$

Where

P_{EM} :Is proportion of exact material before maunfacturing,% .

W_{EM} :Is weight of exact material,g

W_S ;Is weight sample used, g

Degree of hardness :Eq 2 (Alsharifi 2007) (2)

This means applying a pressure of 2 k.g/CM^2 on some grains while they are placed in hardness device until they are broken to pieces.

Proportion of fiber: Eq 3 (Coleman *et al*., 1968)

$$P_{oF}=\frac{W_{Sd}-W_{SB}}{W_S}\times 100 \quad (3)$$

Where :

P_{OF} :Is proportion of fiber,%

W_{Sd} :Is weight of sample after drying . g

W_{SB} :Is weight of sample after burring . g

W_S :Is weight of sample used .g

Proportion of protein : Eq 4 (Coleman *et a,.l* 1968)

$$P_{P=P_N\,\%\times 6.25} \quad (4)$$

P_P -Is proportion of protein .

P_N -Is proportion of nitrogen .

Precentage of bran: Eq 5 (Ali *et al* .,2006).

$$R_{B=\frac{W_{Sw}-W_{Sm}}{W_S}\times 100} \quad (5)$$

Where:

R_B :Is ratio of bran,%

W_{Sw} :Is wheat grain sample weight , g

W_{sm} : Is sample weight after milling, g

W_S :Is weight sample used, g .

Proportion of impurities: Eq 6 (Al sharifi 2007)

$$P_{I=\frac{W_I}{W_S}\times 100} \quad (6)$$

Where

P_I :Is proportion of impurities,% .

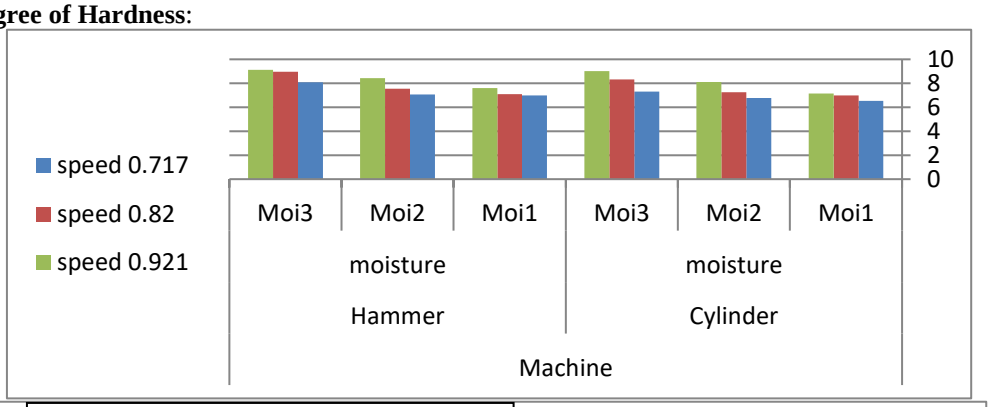
W_I :Is weight of impurities ,g

W_S ;Is used sample weight, g

Then by repeating the same method and measurements of the previous using of the Cylinder type machine , grain moisture15-17%, 17-19% and speed 0.717,0.820 and three replication for wheat clutivar (Ahwaz 1) .Then by repeating the same steps and all accounts using of the Hammer type machine .each moisture content of grain and each speed for same cultivra . Results were analyzed statistically using the design C R Dand tested the difference among treatment for each factor according to the test LSD had less significant difference 0.05.(Oehlent 2010) .

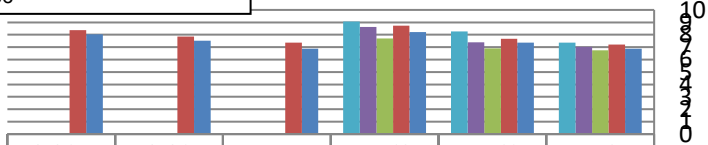
Results and Discussion

1- Degree of Hardness:



LSD=0.05,Machhne=0.064,Moisture= 0.078
Machine* Moisture=0.111
Machine* Moisture* Speed =0.192
Moisture*Speed = 0.136

The interactions



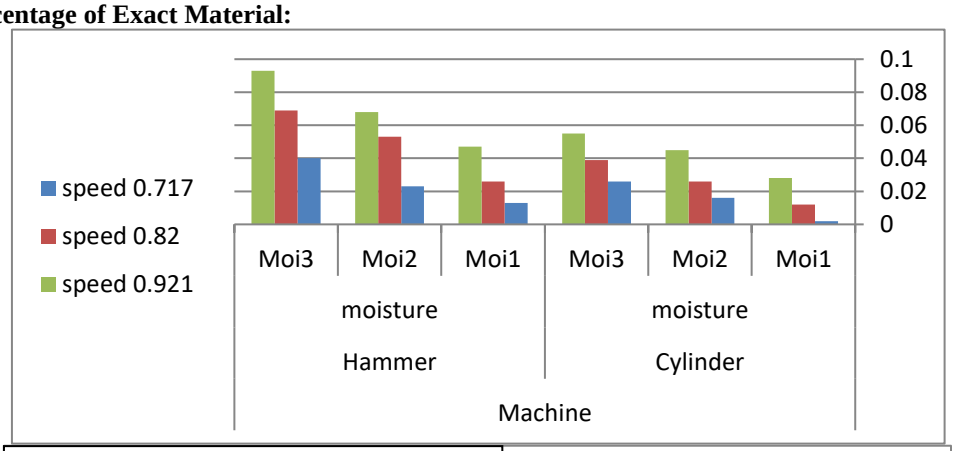
	0.921	0.82	o.717	Moi3	Moi2	Moi1
Machine Cylinder	8.038	7.517	6.866	8.212	7.37	6.885
Machine Hammer	8.382	7.868	7.374	8.721	7.682	7.221
Machine 0.717				7.698	6.908	6.754
Machine 0.82				8.641	7.399	7.037
Machine 0.921				9.06	8.27	7.368

Fig (1) IIIustartes the Effect Machines Types, Speed and Grain Moisture on the Degree of Hardness %.

Figuer 1 shows the influence of the type of machine,clearance ,grain moistuer on the degree of hardness .The results indicated that the Cylinder type machine is significantly better than the Hammer type machine, by an increased of (5.2)%. This is due to easily performance with grains when using of the machine type cylinder as compared with Hammer type machine .These findings are consistent with the findings of (Bamgboye et al 2012) .Increasing in speed leads to a significant increasing extrusive ,If excelled 0.717 on 0.820 and 0.921 by an increase of (7.0 and 8.0)%. respectively .This is due to increased degree of hardness with increased speed .These results are consistent with the results that gained by (Alsaidi 1983).Increasing grain moisture leads to a significant increase and form extrusive .If excelled percentage moistuer content of grain 13-15% it leads to a significant increasing, by an increase of (6.7 and 12.5)% respectively as compared with the grain moisture 15-17% and 17-19%. This is due to the increased moisture of grain leads to smash without break-up ,hence increased percentage of hardness .These results are consistent with the results that gained by (Chung et al 2003),.The overlap between the grain moisture and speed is significantly.While the superiority of overlap between the grain moisture 13-15% and speed 0.717% on overlap between the grain moisture 17-19% and speed 0.921% ,by a decrease of (34.1)%.Also the overlap between the machine type speed is significant too because is more significant better, the overlap between the Cylinder type machine and the speed 0.717% as comparing with the Hammer type machine and the speed 0.921 by a decrease of (22.1)%. While the overlap between the machine type and grain moisture is significantly .The lowest degree of hardness, when the overlap between the type

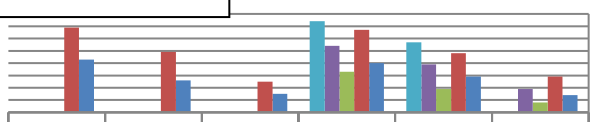
machine Cylinder and the grain moisture 13-15% as comparing with the Hammer type machine with grain moistuer 17-19% ,by a decrease of (26.7)%. The best low rate (39.6)% have come from the triple overlap among Cylinder type,grain moisture 13-15% and speed 0.717.

2- Percentage of Exact Material:



LSD=0.05,Machhne=0.002,Moisture= 0.003
Machine* Moisture=0.004
Machine* Moisture* Speed =0.006
Moisture*Speed = 0.005

The interactions



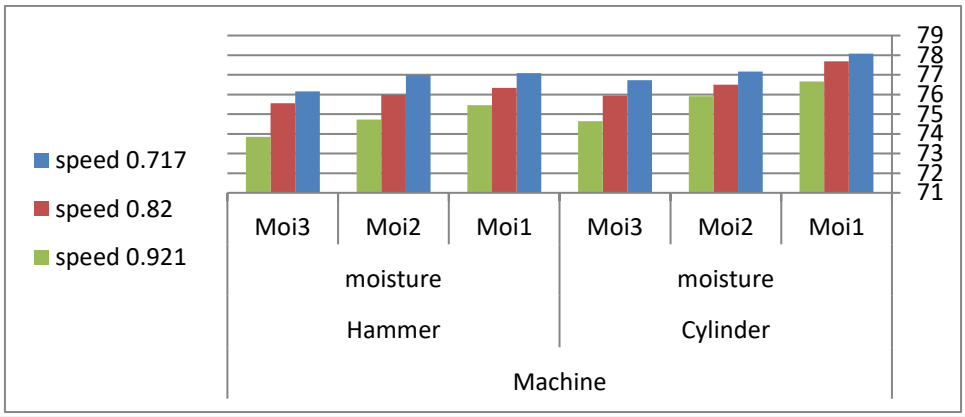
	0.921	0.82	o.717	Moi3	Moi2	Moi1
	Speed			Moisture		
Machine Cylinder	0.043	0.026	0.015	0.04	0.029	0.014
Machine Hammer	0.069	0.049	0.025	0.067	0.048	0.029
Machine 0.717				0.033	0.019	0.008
Machine 0.82				0.054	0.039	0.019
Machine 0.921				0.074	0.057	0

Fig (2) IIIustartes the Effect Machines Types, Speed and Grain Moisture on the Percentage of Exact Material %.

Figuer 2 shows the influence of the type of machine,clearance ,grain moistuer on the percentage of exact material% .The results indicate that the machine type Cylinder is significantly better than the machine type Hammer, by a decreased of (42.8)%. This is due to easily dealing with of the grains when using of the Cylinder type machine as compared with machine type Hammer .These findings are consistent with the findings of (Alsharifi 2007) . Decreasing grain moisture leads to a significant decreasing and form extrusive .If excelled percentage moistuer content of grain 13-15% it leads to a significant decrease, by a decrease of (80.9 and 39.5)% respectively as compared with the grain moisture 15-17% and 17-19%. This is due to increased moisture of grain leads to smash of the grain ,hence increased percentage of exact material .These results are consistent with the results that gained by (Aldaly,1987),.And when increasing the speed leads to asignificant increase extrusive ,If excelled 0.717 on 0.820 and 0.921 by an increase of (85.0 and51.3)%. respectively .This is due to increased percentage of exact material with increased the speed .These results are consistent with the results that gained by (Alsaadi et al 2012).The overlap between the grain moisture and speed is significantly .While the superiority of overlap between the grain moisture 13-15% and speed 0.717 on overlap between the grain moisture 17-19% and speed 0.921 ,by a decrease of (82.5)%.Also the overlap between the speed type machine is significant too because significant better, the overlap between the Cylinder type machine and the speed 0.717as comparing with the Hammer type machine and the speed 0.921 by a decrease of (360.0)%. While the overlap between the type machine and grain moisture

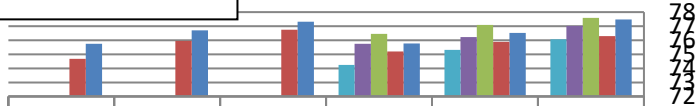
is significantly .The lowest percentage of exact matrial, when the overlap between the Cylinder type machine and the grain moisture 13-15% as comparing with the Hammer type machine with the grain moistuer 17-19% ,by a decrease of (378.6)%. The best low rate (455.0)% have come from the triple overlap among Cylinder type,grain moisture 13-15% and speed 0.717

3-percentage of Fiber:



LSD=0.05,Machhne=0.095,Moisture= 0.117
Machine* Moisture=0.165
Machine* Moisture* Speed =0.286
Moisture*Speed = 0.202

The interactions



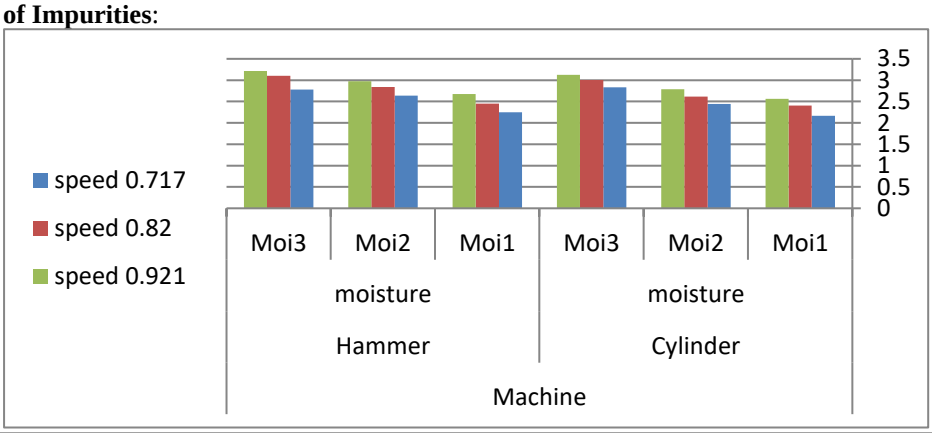
	0.921	0.82	o.717	Moi3	Moi2	Moi1
	Speed			Moisture		
Machine Cylinder	75.74	76.706	77.327	75.775	76.526	77.472
Machine Hammer	74.672	75.959	76.746	75.189	75.893	76.296
Machine 0.717				76.447	77.079	77.582
Machine 0.82				75.751	76.234	77.013
Machine 0.921				74.246	75.315	76.056

Fig (3) IIlustartes the Effect of Machines Types, Speed and Grain Moisture on the Percentage of Fiber %.

Figuer 3 shows the influence of the type of machine,clearance ,grain moistuer on the percentage of fiber % .The results indicate that the Cylinder type machine is significantly better than the Hammer type machine, by a increased of (1.1)%. This is due to accuracy deal with of the grains when using of the machine type cylinder leads to increased percentage of fiber as compared with Hammer type machine .These findings are consistent with the findings of (Al Saadi et al.,2010) .When increasing grain moisture leads to a significant decrease and form extrusive .If excelled percentage moistuer content of grain 13-15% it leads to a significant decrease, by a decrease of (0.8 and 0.9)% respectively as compared with the grain moisture 15-17% and 17-19%.Because of loss of high percentage with peel when increased moisture content of grain hence decrease percentage of fiber .These results are consistent with the results that gained by (Aldaly,1987),.And when increasing the speed leads to asignificant decrease extrusive ,If excelled 0.717 on 0.820 and 0.921 by a decrease of (0.9 and1.5)%. respectively .This is due to decreased percentage of fiber with increased the speed leads to loss a high percentage from the fiber with the peels.These results are consistent with the results that gained by (Ogunsina et al 2007).The overlap between the grain moisture and speed is significantly .While the superiority of overlap between the grain moisture 13-15% and speed 0.717 on overlap between the grain moisture 17-19% and speed 0.921 ,by an increase of (4.5)%.Also the overlap between the machine type speed is significant too because significant better, the overlap between the

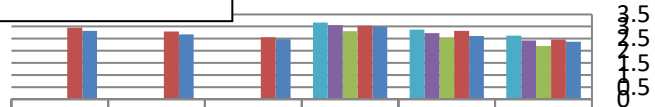
Cylinder type machine and the speed 0.717as comparing with the Hammer type machine and the speed 0.921 by an increase of (3.5)%. While the overlap between the machine of type and grain moisture is significantly .The highest percentage of fiber, when the overlap between the Cylinder type machine and the grain moisture 13-15% as comparing with the Hammer type machine with the grain moistuer 17-19% ,by an increase of (3.0)%. The best high rate (5.7)% have come from the triple overlap among type Cylinder ,grain moisture 13-15% and speed 0.717

4- percentage of Impurities:



LSD=0.05,Machhne=0.026,Moisture= 0.032
Machine* Moisture=0.045
Machine* Moisture* Speed =0.079
Moisture*Speed = 0.056

The interactions



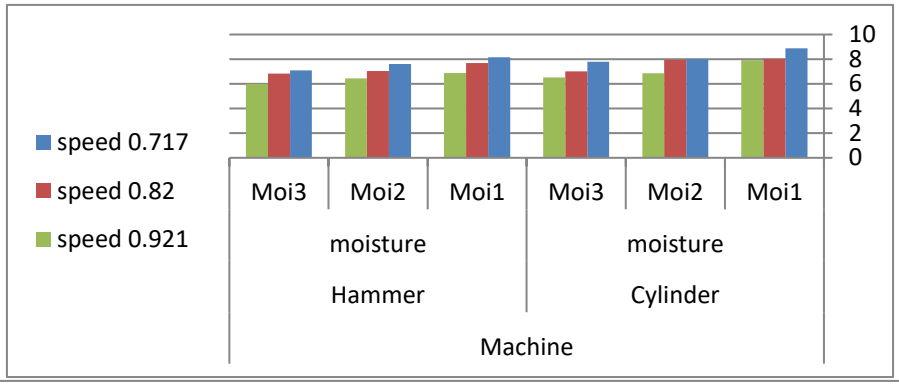
	0.921	0.82	o.717	Moi3	Moi2	Moi1
	Speed			Moisture		
Machine Cylinder	2.823	2.676	2.48	2.988	2.613	2.378
Machine Hammer	2.957	2.799	2.555	3.036	2.817	2.458
Machine 0.717				2.808	2.539	2.205
Machine 0.82				3.057	2.726	2.43
Machine 0.921				3.17	2.88	2.621

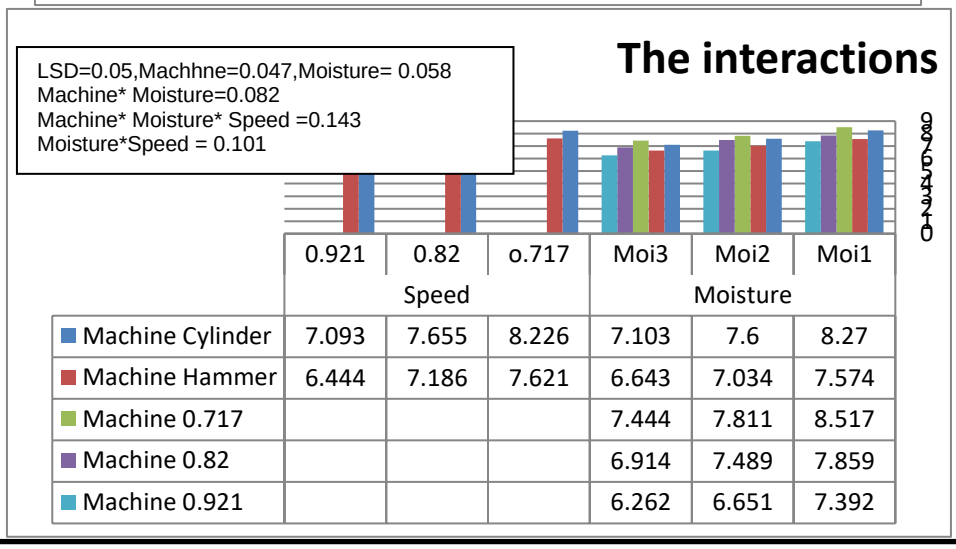
Fig (4) IIIustartes the Effect Machines Types, Speed and Grain Moisture on the Percentage of Impurities %.

Figuer 4 shows the influence of the type of machine,clearance ,grain moistuer on the percentage of impurities % .The results indicate that the Cylinder type machine is significantly better than the Hammer type machine, by a decreased of (4.1)%. This is due to easily dealing with of the grains when using of the Cylinder type machine during milling process as compared with Hammer type machine .These findings are consistent with the findings of (Alsharifi 2007) .decreasing grain moisture leads to a significant decrease and form extrusive .If excelled percentage moistuer content of grain 13-15% it leads to a significant decrease, by a decrease of (10.9 and 10.0)% respectively as compared with the grain moisture 15-17% and 17-19%. This is due to increased moisture of grain leads to smash of the grain ,hence increased percentage of impurities .These results are consistent with the results that gained by ((Kunze and Calderwood, 2004),.And when increasing the speed leads to asignificant increase extrusive ,If excelled 0.717 on 0.820 and 0.921 by an increase of (8.7 and 5.6)%. respectively .This is due to increased percentage of impurities with increased the speed .These results are consistent with the results that gained by (Li et al., 2003).The overlap between the grain moisture and speed is significantly .While the superiority of overlap between the grain moisture 13-15% and speed 0.717 on overlap between the grain moisture 17-19% and

speed 0.921 ,by a decrease of (43.7)%.Also the overlap between the type machine speed is significant too because significant better, the overlap between the Cylinder type machine and the speed 0.717as comparing with the Hammer type machine and the speed 0.921 by a decrease of (19.2)%. While the overlap between the machine type and grain moisture is significantly .The lowest percentage of impurities, when the overlap between the Cylinder type machine and the grain moisture 13-15% as comparing with the Hammer type machine with the grain moistuer 17-19% ,by a decrease of (27.6)%. The best low rate (48.6)% have come from the triple overlap among type Cylinder ,grain moisture 13-15% and speed 0.717

5-Percentage of Protien :





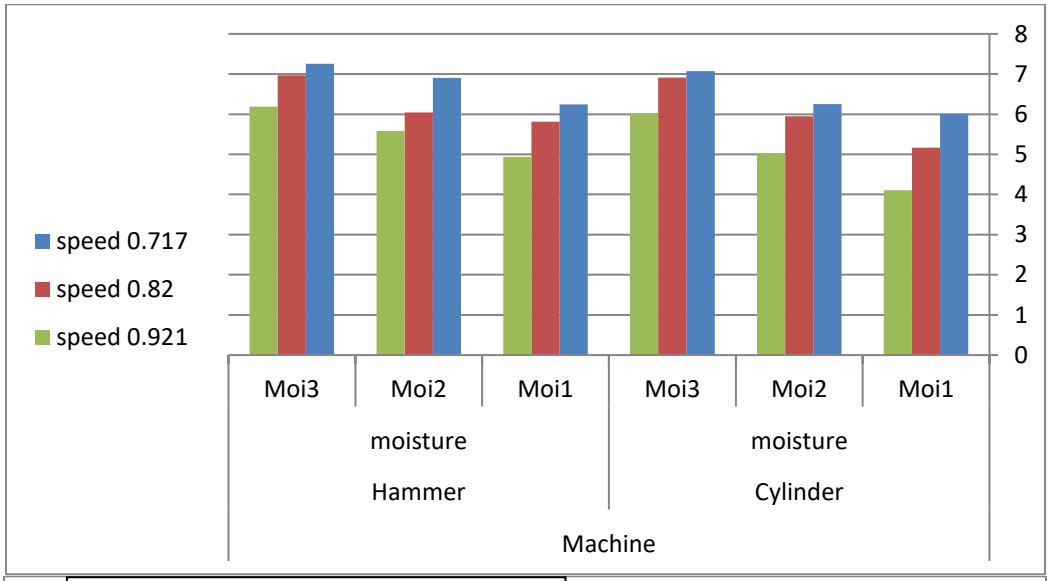
	0.921	0.82	o.717	Moi3	Moi2	Moi1
	Speed			Moisture		
Machine Cylinder	7.093	7.655	8.226	7.103	7.6	8.27
Machine Hammer	6.444	7.186	7.621	6.643	7.034	7.574
Machine 0.717				7.444	7.811	8.517
Machine 0.82				6.914	7.489	7.859
Machine 0.921				6.262	6.651	7.392

Fig (5) IIIustartes the Effect Machines Types, Speed and Grain Moisture on the Percentage of Brotien %.

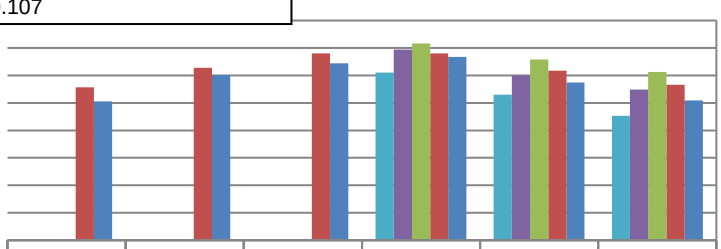
Figuer 5 shows the influence of the type of machine,clearance ,grain moistuer on the percentage of brotien % .The results indicate that the Cylinder type machine is significantly better than the Hammer type machine, by a increased of (8.1)%. This is due to accuracy deal with of the grains when using of the Cylinder type machine leads to increased percentage of brotien as compared with Hammer type machine .These findings are consistent with the findings of (Dexter and Wood, 1996) . When increasing grain moisture leads to a significant decrease and form extrusive .If excelled percentage moistuer content of grain 13-15% it leads to a significant decrease, by a decrease of (8.3 and 6.5)% respectively as compared with the grain moisture 15-17% and 17-19%. Because of occasion moisture during milling process hence increase percentage of protien .These results are consistent with the results that gained by (Hemery et al.,2010).And when increasing the speed leads to asignificant decrease extrusive ,If excelled 0.717 on 0.820 and 0.921 by a decrease of (6.8 and 9.6)%. respectively .This is due to decreased percentage of protien with increased the speed leads to loss a high percentage of the protien with the peels.These results are consistent with the results that gained by (Singh et al, 2010).The overlap between the grain moisture and

speed is significantly .While the superiority of overlap between the grain moisture 13-15% and speed 0.717 on overlap between the grain moisture 17-19% and speed 0.921 ,by an increase of (36.0)%.Also the overlap between the speed type machine is significant too because significant better, the overlap between the Cylinder type machine and the speed 0.717as comparing with the Hammer type machine and the speed 0.921 by an increase of (27.7)%. While the overlap between the machine type and grain moisture is significantly .The highest percentage of protien, when the overlap between the Cylinder type machine and the grain moisture 13-15% as comparing with the Hammer type machine with the grain moistuer 17-19%,by an increase of (24.5)%. The best high rate (47.6)% have come from the triple overlap among type Cylinder ,grain moisture 13-15% and speed 0.717.

6. Proportion of Bran:



LSD=0.05,Machhne=0.050,Moisture= 0.061
Machine* Moisture=0.087
Machine* Moisture* Speed =0.152
Moisture*Speed = 0.107



	0.921	0.82	o.717	Moi3	Moi2	Moi1
	Speed			Moisture		
Machine Cylinder	5.055	6.009	6.446	6.669	5.746	5.096
Machine Hammer	5.57	6.276	6.802	6.807	6.176	5.666
Machine 0.717				7.164	6.58	6.129
Machine 0.82				6.943	5.997	5.489
Machine 0.921				6.106	5.306	4.526

Fig (6) IIlustartes the Effect Machines Types, Speed and Grain Moisture on the Percentage of Bran %.

Figuer 6 shows the influence of the type of machine,clearance ,grain moistuer on the percentage of bran% .The results indicate that the Cylinder type machine is significantly better than the Hammer type machine, by a decreased of (6.5)%. because of type and efficiency of machine which using in the manufacture process .These findings are consistent with the findings of (Bautista et al 2002) .When increasing grain moisture leads to a significant increase and form extrusive .If excelled percentage moistuer content of grain 13-15% it leads to a significant increase, by an increase of (10.8 and 13.0)% respectively as compared with the grain moisture 15-17% and 17-19%. Because of they contain on high proportion of moisture leads to increase of the percentage of bran.These results are consistent with the results that gained by (Mousia et al.,2004).And when increasing the speed leads to asignificant decrease extrusive ,If excelled 0.717 on 0.820 and 0.921 by a decrease of (7.8 and 15.6)%. respectively .This is due to less of the peel which removing of the grain when increase clearance between cylinders.These results are consistent with the results that gained by (Delcour and Hoseney.,2010).The overlap between the grain moisture and speed is significantly .While the superiority of overlap between the grain moisture 13-15% and speed 0.717 on overlap between the grain moisture 17-19% and speed 0.921 ,by an increase of (58.3)%.Also the overlap between the machine type speed is significant too because significant better, the overlap between the Cylinder type machine and the speed 0.717as comparing with the Hammer type machine and the speed 0.921 by an increase of (15.7)%. While the overlap between the machine type and grain moisture is significantly .The highest percentage of bran, when the overlap between the Cylinder type machine and the grain moisture 13-15% as comparing with the Hammer type machine with the grain moistuer 17-19%,by an increase of (33.6)%. The best low rate (76.5)% have come from the triple overlap among type Cylinder ,grain moisture 13-15% and speed 0.717

Conclusions:

The Cylinder type machine was significantly better than the Hammer type machine in all studied traits.The grain moisture content 13-15% superiority significantly for two levels 15-17% ,17-19% in all studied traits .The speed 0.717 superior significantly on others two speed 0.717,0.820 in all studied traits. The overlap between the cylinder type machine and grain moisture 13-15% superior significantly in all studies traits .And also overlap between the Cylinder type machine with speed 0.717 in all studied traits. The best results have come from the triple overlap among machine type Cylinder, grain moisture (13-15%), and speed 0.717.

Recommendations:

Recommends with carried out future studies using other of machinery types and other varieties of wheat.

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