A comparative study of reproductive performance of *Ross 308* and *Marshall R Plus* Broiler Breeder females strain stocks during production period

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Abstract

This study was designed to compare the production performance of both *Ross 308* and *Marshall R Plus* broiler breeder strain, whereas the ambient temperature ranged between 7.9ºC to 30.10ºC. A total of 36,000 25 wks- old hens of broiler breeders *Marshall R Plus* and *Ross 308*. The hen of each strain (18000 hens) was randomly distributed to five open houses as replicates (3,600 hens per house). Fed ad libitum on balanced ration and available water according to Management Guide recommendations for each strain. Production performance percentage, such as egg production of hen housed (HH) and hen day (HD), feed intake (FI), feed conversion ratios (FCR), mortality, selected and unselected eggs for hatching, broken and a double yolk, was recorded from 26 to 57 weeks of age. The whole production period divided into eight production periods for each strain by randomized complete block design as 2 × 8 factorial arrangement of treatments. The results showed significant differences in strain, production period and their interaction on HD, HH, FI and FCR. *Ross 308* strain had higher HD and HH, lower FI and better FCR than *Marshall* Strain. Also, the strain and production period had a significant effect on the selected, unselected, broken and double yolk and mortality. *Ross 308* strain had higher selected eggs for hatching, broken and mortality and lower unselected and double yolk eggs than *Marshal* strain during the completely experimental period. It can be concluded from this study that *Ross* had better performance in all studied traits except mortality and broken eggs percentages.

Keywords: Broiler Breeder, Strain, *Ross 308*, *Marshall R Plus*, Performance.

Introduction

In the second half of the twentieth century, a tremendous development was witnessed in the poultry industry in the world due to the increasing international competition and thus become a global important economic activity (13 & 15). Developed broiler breeders are a compromise between two selectively different standards, where it was stated that they have the genetic ability to grow rapidly and a high production rate of hatching eggs to producing of broiler chickens (9). The genetic selection of the broiler breeders focuses mainly on increased meat production in the chicks produced, so the productive capacity for eggs is low in broiler breeder (1).

In addition, the sexual maturity of broiler breeders is influenced by the physiological age (body weight) and chronological age (weeks) (2). The body weight and the age play an important role in broiler breeders in reaching the sexual maturity (20; 7). The sexual maturity delays in the birds that are decreased in the body weights, while the age factor has a strong effect on the beginning of reproductive cycle when the maturation of the hypothalamus (ability to respond to the optical hormone and feedback), which is related with age instead of the body weight (17).

Poultry industry was originated in Yemen since the mid-seventies of the past century and then developed gradually and continuously, where one day-old chicks and ready-made feed was imported from some European countries such as the Netherlands that had been supporting poultry production in Yemen. Thereafter, many commercial hatcheries were established by local poultry companies, which are relying on imported hatching eggs from the international companies

specialized in poultry production. At present, several broiler breeders were imported for supplying the commercial local hatcheries with hatching eggs (3). In the Republic of Yemen, poultry sector contributed 38.3% of the total value of animal production in the year 2003, which accounts for 20.4% of the total local agricultural production value for the same year (12). Many commercial breeder strains were imported to Yemen (*Ross 308*, *Hubbard ISA*, *Hubbard GV*, *Hydro BAN*, *Hybro G*, and *Marshall R Plus*. *Ross 308* and *Hubbard ISA*) as reported by Daghir, (6), but their productive performance was not evaluated under the local environmental conditions in Yemen. Although, a study was conducted in Yemen to compare some of the productive and physiological characteristics between the broilers of two strains *Ross 308* and *Marshall R Plus* under the rearing conditions (8). So this study was conducted to evaluate productive performance of two breeder strains (*Ross 308* and *Marshall R Plus*) raised.

Materials and Methods

Experimental design and Management

Table.1 Ingredient and calculated nutrient composition of the basal production diet fed to *Ross 308* and *Marshall R Plus* broiler breeder Strains from 26 to 57 W of age.

Ingredients %	***Ross 308***	***Marshall R Plus***
Yellow Corn	65	62
SBM 48%	17.3	18
Wheat Bran	5	6.3
[a] Breeders Premix Concentrate 5%	5	5
Limestone	7	4
Oyster Shell	0	4
Chinese Premix	0	0.2
Mycofix Plus (Breeders)	0.1	0.1
Anti-DE calcium	0.4	0.4
Choline Chloride (Anti Fattening)	0.2	0
Total	**100**	**100**
Calculated analysis		
Metabolism Energy (Kcal/Kg)	2708.7	2650.0
Crude protein (%)	15.69	15.99
Crude fiber (%)	3.71	3.82
Energy Protein Ratio	172.65	165.83
Calcium (%)	3.99	3.32
Available P (%)	0.31	0.30
Ca : P Ratio	9.89	10.67
Sodium (%)	0.11	0.11
Arginine (%)	0.99	0.92
Lysine (%)	0.77	0.79
Methionine (%)	0.33	0.33
Methionine+ cysteine (%)	0.58	0.59
Threonine (%)	0.63	0.63
Tryptophan (%)	0.20	0.21

[a] Each kilogram of diet contains the flowing percentage 20 protein, 2000 Kcal/kg ME, 6.2 calcium, 14 Available Phosphor, 2.6 Sodium, 2.4 Potassium, 0.7 Arginine, 2.2 Lysine, 1.85 Methionine, 2.4 Methionine+ Cysteine, 1.1 Threonine, 0.35 Tryptophan, 7 Crude Fiber. [b] Values were calculated according to the nutrient requirements of the *Ross 308* and *Marshall R Plus* Broiler Breeders.

This study was conducted on Al-Sayani Poultry Co Broiler Breeder farms located in Ibb, Yemen, during 22-4 to 1- 9- 2015 period. A total of 36,000 25 wks- old hens of broiler breeders *Ross 308* and *Marshall R Plus*, 18000 hen of each were used in this study. The hens of each breed were distributed to five open houses. Minimum and maximum temperature during the experimental period in Ibb was 7.9-16.9 and 21-30.10C, respectively. A total of 3,600 hens was placed in each house and sex ratio was 1 male: 10 females. The birds received water and standard layer ration (Table 1) ad libitum. Egg production from 26 to 57 weeks of age was recorded for each strain. The whole production period was divided into eight (4 weeks) production periods for each strain. Hen housed (HH %) and hen day (HD %) production was calculated as follows:

HH% = {total number of eggs produced / (number of hens housed x number of days of production period)} *100

HD= {total number of eggs produced during a period / number of hens-days in the same period} 100.

Daily mortality and weekly feed intake were recorded during the different production periods for each strain. In addition, feed conversion ratios (FCR) were calculated (daily feed consumed / mass of eggs produced). Selected and unselected eggs for hatching, broken and a double yolk egg number were recorded and their percentages of the total eggs produced were calculated. Feed experimental diets were prepared in the company hummer mill and all birds of the two strains were fed on productivity diets containing 15.69 and 15.99 % protein and 2708.7 and 2650.0 kcal/ kg, respectively, according to the recommendations of the breeder companies of each strain (Table 1). Also, care, vaccination and lighting programs are performed according to the instructions recommended by the breeder company for each strain.

Eggs were daily collected manually by plastic dishes during four intervals, three times in the morning from half past seven am to twelve noon, the fourth period from three to five, pm. Eggs collected were sorted well for the hatching according to the required specifications including egg shape, size as well as egg shell condition. The suitable eggs for hatching were transferred directly to the sterilizing chamber by a steam of Formaldehyde gas (methanol) Potassium permanganate provided by mixing 0.6 gram of potassium permanganate with 1.2 cc. of formalin (37.5 percent) for each cubic foot of space in the room and stored for a week at 18-20 ^{0}C and 80% relative humidity until it was transferred to the hatchery.

Statistical analysis

All data were analyzed using the General Linear Model procedure of the Statistical Analysis System SAS, (18) by randomized complete block design as 2 × 8 factorial arrangement of treatments that included type of strain (2 strains) and period of production (8 periods), and their respective interactions. Duncan's test was applied to compare the treatment means when the treatment effect was significant at $P < 0.05$ statistical level.

Table 2: Effect of strain and production period on hen housed (HH %), hen day (HD %) production, feed intake (FI) and feed conversion ratios (FCR) in Broiler Breeder Females

Strain (S)	**Parameters**			
	HD	**HH**	**FI**	**FCR**
	%	**%**	**d/g**	**Kg: kg**
Ross 308	69.2[a]	63.1[a]	168.4[b]	4.5[b]
Marshall R Plus	60.2[b]	57.5[b]	170.9[a]	5.9[a]
SEM[1]	1.262	1.052	0.670	0.091
P-value	<.0001	0.0005	0.0125	<.0001
Production period (PP)				
1	42.1[d]	41.6[f]	166.8[d]	8.7[a]
2	81.6[a]	79.5[a]	181.8[a]	4.1[d]
3	83.5[a]	80.2[a]	181.6[a]	3.9[d]
4	76.4[a]	72.1[b]	176.1[b]	4.2[cd]
5	67.1[b]	62.1[c]	171.4[c]	4.6[c]
6	57.4[c]	51.6[d]	163.6[d]	5.2[b]
7	51.6[c]	45.2[ef]	157.8[e]	5.7[b]
8	57.6[c]	49.8[de]	158.4[e]	5.6[b]
SEM[1]	2.524	2.104	1.340	0.182
P-value	<.0001	<.0001	<.0001	<.0001
S*PP				
P-value	<.0001	<.0001	<.0001	<.0001

[a - f] Mean value within a columns with different superscripts are significantly different P< 0.001.Data effect of Strain are means of forty replicate birds (n= 40) of dietary Strain each, data effect of period are means of ten replicate birds (n= 10) and data interaction effect are means of five replicate hens as average from house (n= 5).
[1]SEM, standard error of the mean.

Results

As it is shown in Table 2, strain (S), production period (PP) and their interaction had a significant (P <.0001) effect upon a hen-day egg production (HD), hen-house egg production (HH), feed intake (FI) and feed conversion ratio (FCR). Broiler breeders of *Ross 308* strain had significantly (P <.0001) higher percentage of HD and HH, lower FI and better FCR than broiler breeders of *Marshall* Strain. The same Table also shows that HD, HH and FI reached their peak during the third production period, thereafter started to decrease and FCR was the best during the second and third production period. *Ross* and *Marshall* reached their peak HD during the second and third production period, respectively.

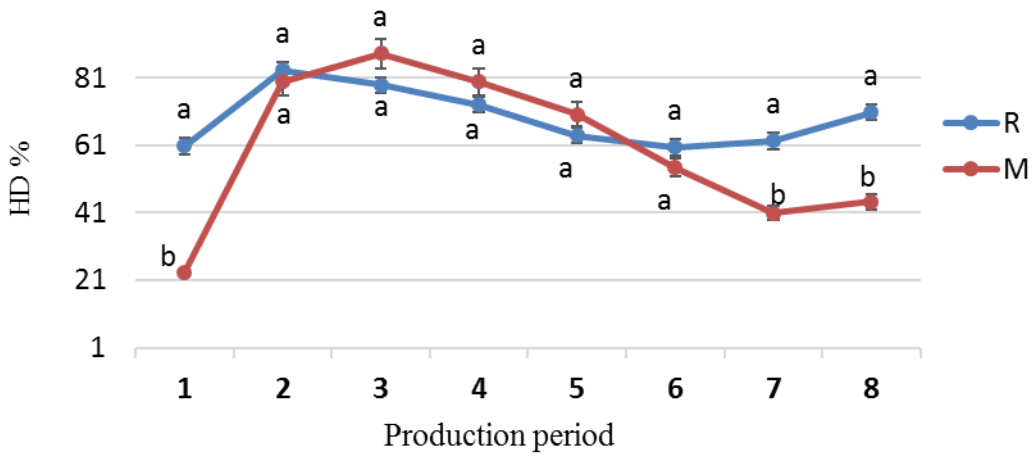

Figure 1. Interaction effect Broiler Breeder strain and production period on HD (%)

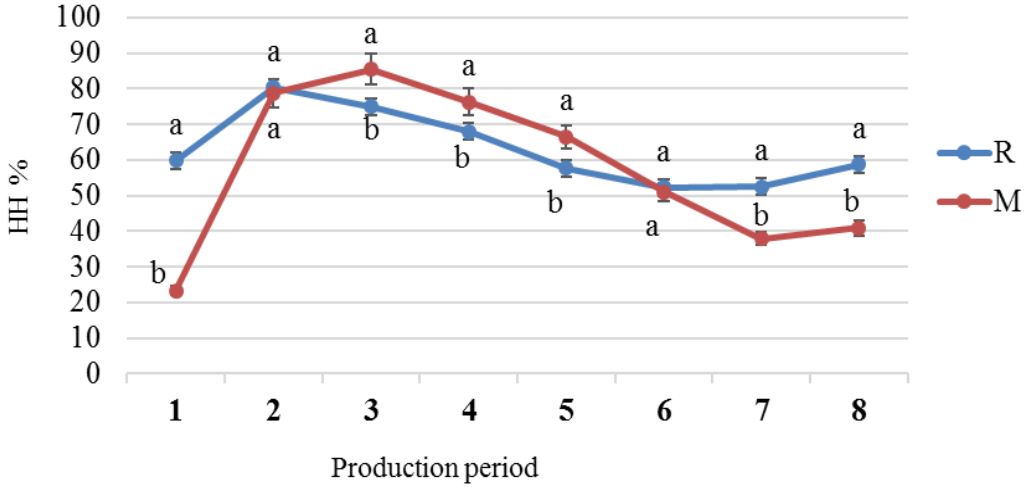

Figure 2. Interaction effect Broiler Breeder strain and production period on HH (%)

Ross had significantly ($P < 0.05$) higher HD during the 1st, 7th and 8th production periods than *Marshall* and tended to have lower HD during most of the other production periods (Fig.1). A similar trend was noticed for HH (Fig.2). *Ross* had significantly ($P < 0.05$) lower during the 3rd, to 6th and higher FI during the 1st and 8th, and better feed conversion during the 1st, 7th and 8th production periods than *Marshall* (Fig. 3 and 4).

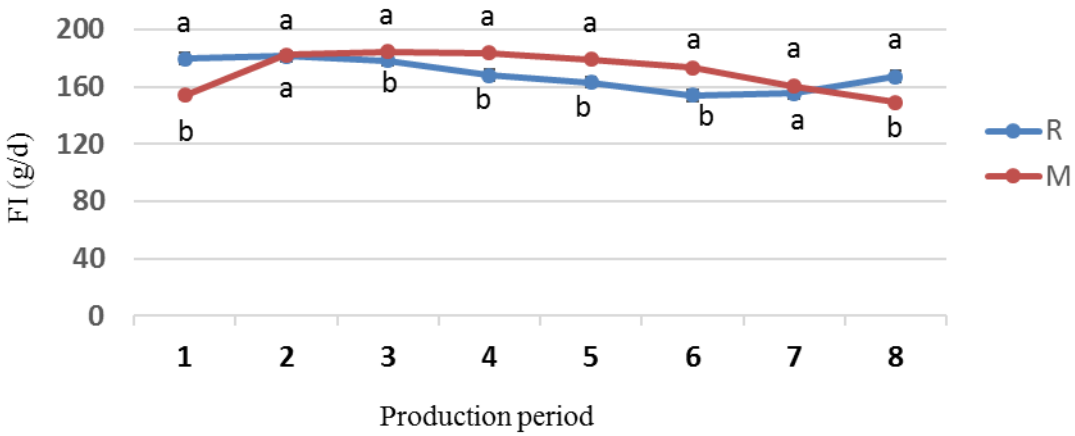

Figure 3. Interaction effect Broiler Breeder strain and production period on FI (g/d)

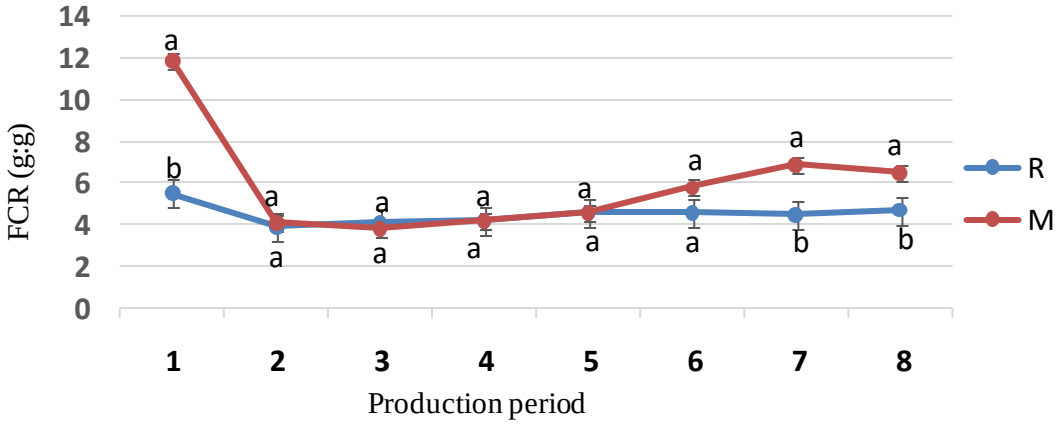

Figure 4. Interaction effect Broiler Breeder strain and production period on FCR(g:g)

Table 3 shows that strain (S) and production period (PP) had a significant (P <.0001) effect upon selected, unselected, broken and double yolk and mortality. Broiler breeders of *Ross 308* strain had significantly (P <.0001) higher percentage of selected, broken and mortality and lower unselected and double yolk eggs, compared to *Marshal* during the whole experimental period. Selected eggs for hatching were significantly (P <0.05) the lowest during the 1st and the highest during the last three production periods, whereas unselected eggs were the highest during the 1st and lowest during the 3rd production periods (Table 3).

Table 3: Effect of strain and production period on egg selected, egg unselected, egg broken, egg double yolk and Mortality in Broiler Breeder Females

Strain (S)	Parameters				
	Selected	**Unselected**	**Broken**	**Double yolk**	**Mortality**
	%	**%**	**%**	**%**	**%**
Ross 308	95.3^{a}	2.8^{b}	1.2^{a}	0.6^{b}	0.59^{a}
Marshall R Plus	91.4^{b}	6.2^{a}	0.8^{b}	1.4^{a}	0.25^{b}
SEM[1]	0.185	0.154	0.047	0.033	0.033
P-value	<.0001	<.0001	<.0001	<.0001	<.0001
Production period (PP)					
1	74.9^{c}	22.3^{a}	0.9^{a}	1.8^{c}	0.39^{bcd}
2	95.2^{b}	1.3^{cd}	0.9^{a}	2.5^{b}	0.43^{bcd}
3	95.3^{b}	0.8^{d}	1.0^{a}	2.8^{a}	0.38^{bcd}
4	95.3^{b}	3.1^{b}	1.1^{a}	0.5^{d}	0.47^{abc}
5	95.2^{b}	3.4^{b}	1.1^{a}	0.2^{e}	0.64^{a}
6	96.8^{a}	1.9^{c}	1.0^{a}	0.2^{e}	0.53^{ab}
7	96.9^{a}	1.9^{c}	0.9^{a}	0.1^{e}	0.28^{cd}
8	97.3^{a}	1.6^{cd}	0.9^{a}	0.1^{e}	0.23^{d}
SEM[1]	0.370	0.308	0.094	0.066	0.066
P-value	<.0001	<.0001	0.3855	<.0001	0.0016
S*PP					
P-value	<.0001	<.0001	0.0068	<.0001	0.0002

$^{a-d}$ Mean value within a columns with different superscripts are significantly different P< 0.001. Data effect of Strain are means of forty replicate birds (n= 40) of dietary Strain each, data effect of period are means of ten replicate birds (n= 10) and data interaction effect are means of five replicate hens as average from house (n= 5).
[1]SEM, standard error of the mean.

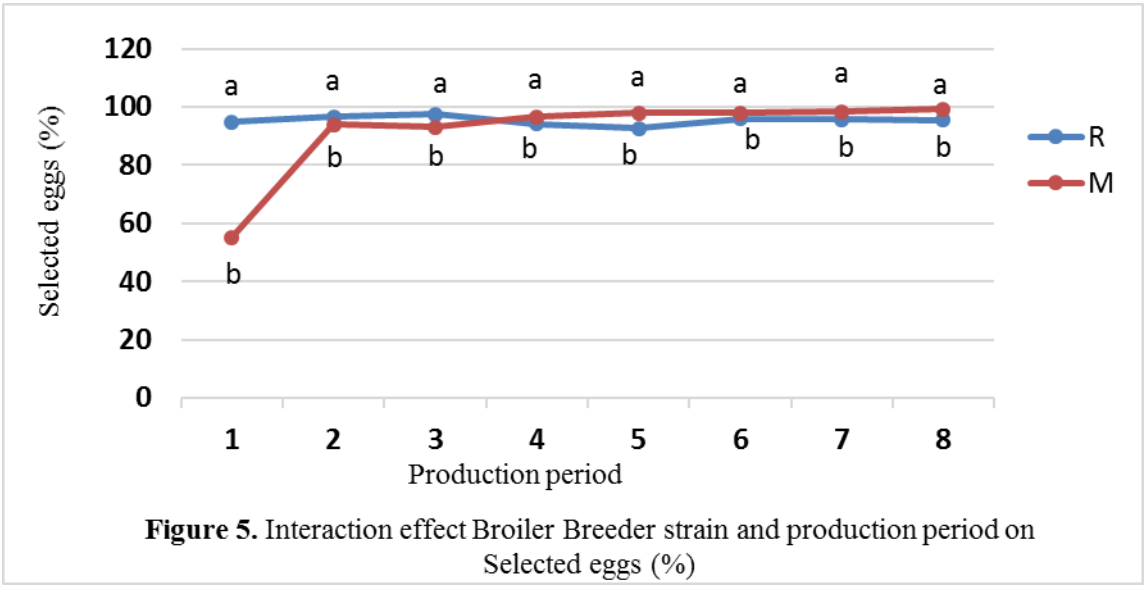

Figure 5. Interaction effect Broiler Breeder strain and production period on Selected eggs (%)

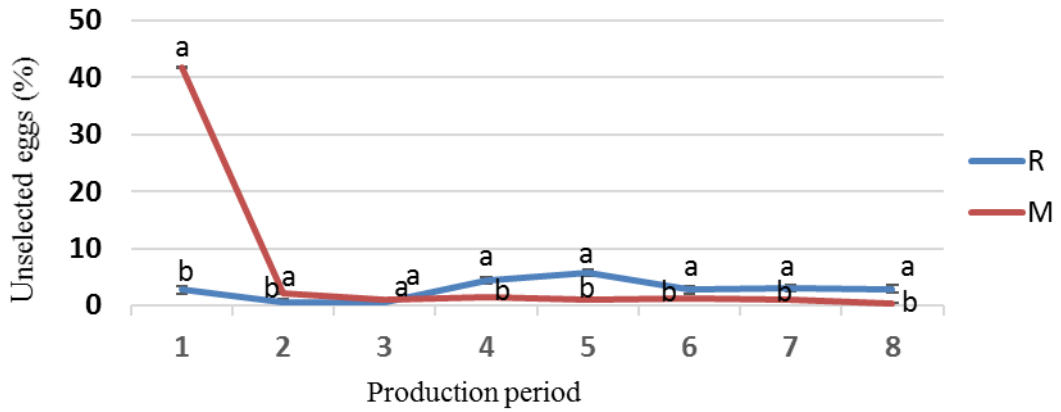

Figure 6. Interaction effect Broiler Breeder strain and production period on unselected eggs (%)

Broken eggs percentages are statistically similar during all production periods and double yolk eggs were the highest during the 3rd and the lowest during the last two production periods. Mortality rate was significantly (P <0.05) the highest and lowest during the 5th and 8th production periods, respectively (Table 3). On the other hand, *Ross* had significantly (P < 0.05) lower selected and double yolk eggs, higher unselected and broken eggs and higher mortality rate most of the production periods, compared to *Marshall* (Fig. 5, 6,7, 8 and 9).

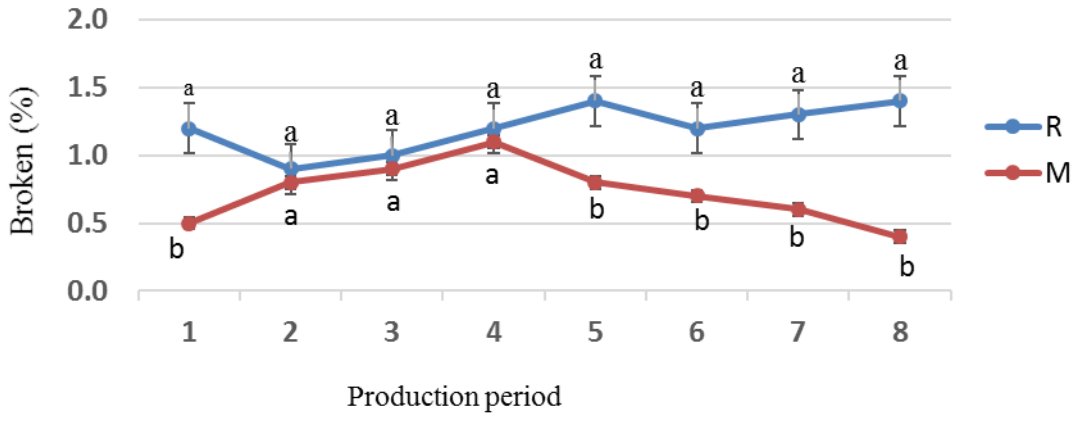

Figure 7. Interaction effect Broiler Breeder strain and production period on Broken (%)

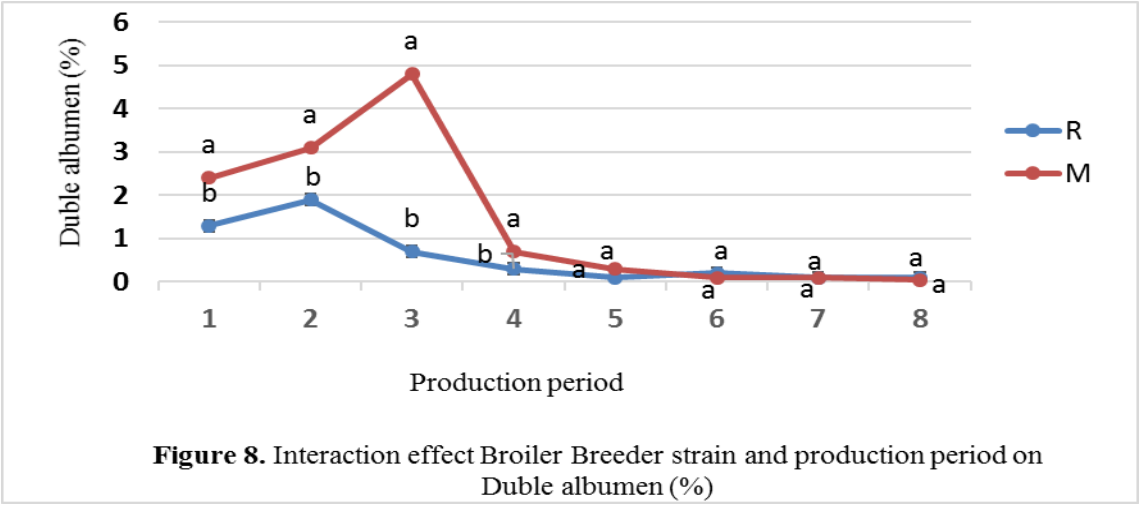

Figure 8. Interaction effect Broiler Breeder strain and production period on Duble albumen (%)

Discussion

The results of this study suggest that strain *Ross 308* surpassed on strain *Marshall R Plus* in the proportion of total egg production (HD and HH) may be due to the strain *Ross 308* began early in the production of hatching eggs before strain *Marshall R Plus*, where egg production lasts in the increase until the end of the production period during comparison. Our results were in agreement with Dunn; *et al*. (7); Applegate (2) & Robinson *et al*. (17) that body weight plays a greater role in the chicken arrival at the age of sexual maturity in providing it's basic components necessary for the completion of sexual organ growth. Younis and Abd El-Ghany (22) reported strain differences in body weight in 4 broiler chicken strains, and 14 local strains (11). Therefore, the body weight is a key factor for the success of the arrival of the body at sexual maturity. Also noted in the current study, the production rate was up to the summit during the period 30 to 41 a week, while production decreased in other production periods of the study. This consistent with Bustany and Elwinger (4); Carnarius *et al*. (5), who reported that chicken progress in age was the reduction in the production rate for broiler breeder. In addition, a study by North *et al*. (14) showed that total egg production and hatchability was a decline with chicken progress in age. Breeder produced eggs for a short period compared with hens, where up to the production summit during 6-10 weeks from the start of production (85%) and after the production gradually with age is reduced to up to 60% at 40 weeks (19).

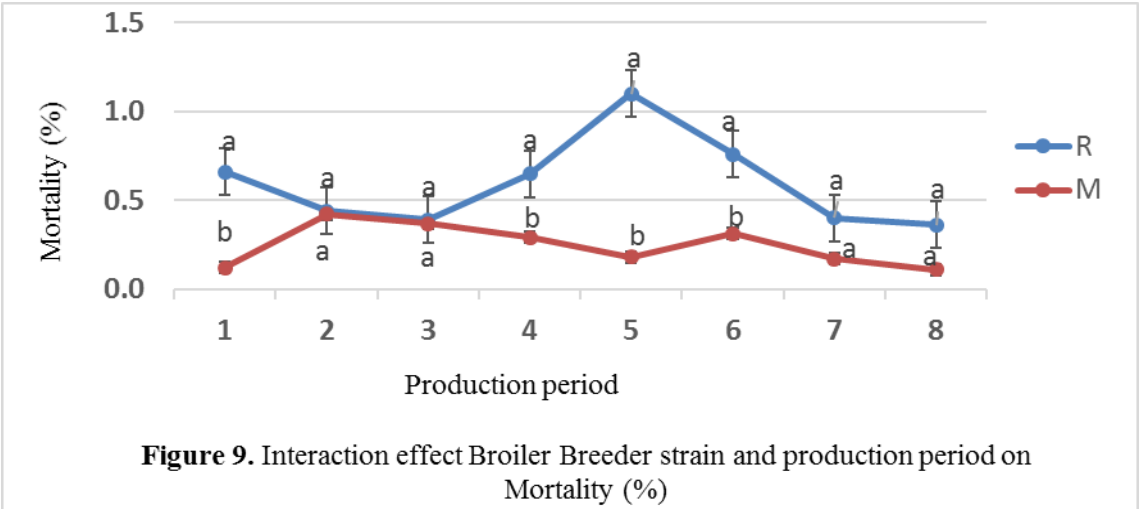

Figure 9. Interaction effect Broiler Breeder strain and production period on Mortality (%)

Strain *Marshall R Plus* was higher in daily feed intake (DFI) compared with strain *Ross 308*, may be due to that *Marshall R Plus* strain was the largest weight than strain *Ross 308* which could lead to higher consumption of feed to cover part of the needs for maintaining on weight. Also noted, during the arrival of egg production to production summit, both strains consumed the largest amount of feed to cover their production of eggs, whereas a greater amount of eggs is large in size during this period, this reflected in FCR to decline during the period of production summit. While we note that FCR in strain *Marshall R Plus* was higher may be due to that feed intake was higher and lower in egg production. Strain *Ross 308* was higher in percentage of selected egg, broken and mortality compared with strain *Marshall R Plus*, may be a result of higher production strain *Ross 308* than *Marshall R Plus*, and there is a general tendency of broken to increase with age. This is consistent with Tona *et al*. (21); Joseph and Moran (10) who reported that the hen's age effects on shell quality. Eggshell was significantly affected by strain Rayan *et al*., (16).

Conclusion

In conclusion, the results of this study show that *Ross* had better performance in all studied traits except mortality and broken eggs percentages. However, both strains showed lower peak and average hen day production and higher feed intake than reported in the company management guide for the same production period. This might be due to the fact that birds were raised in open houses where minimum and maximum reaches 7.9 and 30.10C, respectively.

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References

1- **Abd Elwahab, A. M. (2016)** Comparison between Four Commercial Broiler Breeds in Production Performance and Carcass Characteristics under Sudan Condition. Sudan University of Science and Technology. Master Thesis. Pp 52.
2- **Al-Olofi, A. (2005).** Production performance of chicken meat under a number of different nutrition programs. Master Thesis, Faculty of Agriculture, Sana'a University. Pp 44.
3- **Applegate, T. J. (2002).** Reproductive maturity of turkey hens: egg composition, embryonic growth and hatchling transition. Avian and Poultry Biology Reviews, 13, 31-41.
4- **Bustany, Z. A. & Elwinger, K. (1987).** Shell and interior quality and chemical composition of eggs from hens of different strains and ages fed different dietary lysine levels. Acta Agriculturae Scandinavica, 37, 175-187.
5- **Carnarius, K., Conrad, K. Mast, M.& MacNeil, J. (1996).** Relationship of eggshell ultrastructure and shell strength to the soundness of shell eggs. Poultry science, 75, 656-663.
6- **Daghir, N. J. (2008).** Poultry production in hot climates. 2nd Edition CAB. International Press. 387.
7- **Dunn, I., Sharp, P. & Hocking, P. (1990).** Effects of interactions between photostimulation, dietary restriction and dietary maize oil dilution on plasma LH and ovarian and oviduct weights in broiler breeder females during rearing. British poultry science, 31, 415-427.
8- **Hakim, M. M. (2015).** Comparative Study of Production and Physiological Characteristics of *Marshall R plus* and *Ross 308* Meat Breeds Under Education Conditions of Ibb Governorate. Master Thesis, Faculty of Agriculture, Sana'a University. Pp 76.
9- **Havenstein, G., Ferket, P. & Qureshi, M. (2003).** Carcass composition and yield of 1957 versus 2001 broilers when fed representative 1957 and 2001 broiler diets. Poultry Science, 82, 1509-1518.
10- **Joseph, N. & Moran, E. (2005).** Effect of flock age and postemergent holding in the hatcher on broiler live performance and further-processing yield. Journal of applied poultry research, 14, 512-520.

11- **Kosba, M. A. & Abd El–Halim, H. A. H. (2008).** Evaluation of the Egyptian local strains of chicks. Egypt. Poult. Sci., 28:1239-1251.
12- **Ministry of Planning and Development (2003).** Yearbook of Statistics. Yemen.
13- **Nääs, I. (2005).** Pontos críticos no manejo que afetam o bem-estar animal: realidade brasileira. In Conferência Apinco de Ciência e Tecnologia Avícola. APINCO Campinas, 61-66.
14- **North, M. O. & Bell, D. D. (1990).** Commercial chicken production manual. 4th ed Van Nostrand Reinhold, Pp 456.
15- **Pereira, D. F., Nääs, I. Romanini, C. Salgado, D. & Pereira, G. (2007).** Broiler breeder behavior and egg production as function of environmental temperature. Revista Brasileira de Ciência Avícola, 9, 9-16.
16- **Rayan, G. El-Faham, A. Ibrahim, S.& Hattaba, N. (2015).** Comparative study of egg quality, hatching performance and carcass traits for Rhode Island Red, Bahij And Matrouh chicken strains. Egyptian Poultry Science Journal, 35.
17- **Robinson, F. E., G. M. Fasenk o, and R. A. Renema. (2003**). Female Reproduction: Reproductive Abnormalities. P 33-38. In optimizing chick production in broiler breeders. Spotted Cow Press Ltd. Edmonton, Alberta, Canada.
18- **SAS Institute (2008).** SAS Users Guide: Statistics. SAS Institute Inc., Cary, NC.
19- **Scanes, C. Brant, G.G & Ensminger, M. E. (2004).** Poultry Science. Fourth Edition, Pearson Education, Inc., P.P. 257./set-humidity.html.
20- **Soller, M. Eitan, Y. & Brody, T. (1984).** Effect of diet and early qualitative feed restriction on the minimum weight requirement for onset of sexual maturity in White Rock broiler breeders. Poultry Science, 63, 1255-1261.
21- **Tona, K. Onagbesan, O. Ketelaere, B. Decuypere, E. & Bruggeman, V. (2004).** Effects of age of broiler breeders and egg storage on egg quality, hatchability, chick quality, chick weight, and chick posthatch growth to forty-two days. Journal of Applied Poultry Research, 13, 10-18.
22- **Younis, H. & Abd El–Ghany, F. (2003).** Productive and reproductive performance of four local chicken strains during winter and summer seasons. Egypt. Poult. Sci, 23, 893-910.

دراسة مقارنة الأداء الإنتاجي بين قطعان سلالتي أمهات الدجاج اللاحم روص 308 ومارشال R بلس خلال فترة الإنتاج

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الملخص

أجريت هذه الدراسة لمقارنة الأداء الإنتاجي لسلالتي أمهات دجاج اللحم روص 308 ومارشال R بلس، فقد تراوحت درجة الحرارة المحيطة بين 7.9 ºC إلى 30.10 ºC. تم استخدام مجموع 36،000 دجاجة من سلالة روص 308 ومارشال R بلس عمر 25 أسبوعاً. تم توزيع الدجاج من كل سلالة (18000 دجاجة) عشوائياً إلى 5 حظائر مفتوحة مكررات (3600 دجاجة/ حظيرة). التغذية والمياه كانت متوازنة ومتاحة وفقاً لتوصيات دليل إدارة الأمهات لكل سلالة. وقد سجلت نسبة الأداء الإنتاجي مثل إنتاج البيض للدجاج خلال الفترة كاملة (HH) وإنتاج البيض للدجاج في نفس اليوم (HD)، والغذاء المأكول (FI)، ومعامل التحويل الغذائي (FCR)، ومعدل الوفيات، ونسبة البيض الصالح وغير الصالح للتفريخ من 26 إلى 57 أسبوعاً من العمر. قسمت فترة الإنتاج إلى 8 فترات إنتاجية لكل سلالة باستخدام تصميم القطاعات العشوائية الكاملة وفق التجارب العاملية 2 × 8 (2= سلالة و8= فترات الإنتاج). إذ أظهرت نتائج الدراسة الحالية إلى وجود فروق معنوية ($P<0.05$) لكلٍ من السلالة وفترة الإنتاج والتداخل بينهما في FI، HD، HH وFCR. سجلت سلالة روص 308 أعلى HH وHD، وانخفاض في FI وأفضل FCR بالنسبة لسلالة مارشال R بلس. ولوحظ وجود تأثير معنوي ($P<0.05$) للسلالة والفترة الإنتاجية على معدل البيض الصالح وغير الصالح للتفريخ، البيض المكسور والبيض مزدوج الصفار ومعدل الوفيات. إذ أظهرت سلالة روص 308 أعلى معدل في نسبة البيض الصالح للتفريخ، البيض المكسور ومعدل الوفيات في حين انخفضت في معدل البيض غير صالح للتفريخ والبيض مزدوج الصفار مقارنة بسلالة مارشال R بلس خلال الفترة التجريبية كاملة. يمكن الاستنتاج من نتائج هذه الدراسة أن سلالة روص 308 أظهرت أفضل أداء إنتاجي في جميع الصفات المدروسة باستثناء معدل الوفيات والنسب المئوية للبيض المكسور.

الكلمات المفتاحية: أمهات الدجاج اللاحم، سلالة، روص 308، مارشال R بلس، الأداء الإنتاجي.