Available online at www.scholarsresearchlibrary.com

Scholars Research Library

Scholars Research Library

Annals of Biological Research, 2011, 2 (6):300-305
(http://scholarsresearchlibrary.com/archive.html)

Annals of Biological Research
Scholars Research Library
ISSN 0976-1233
CODEN (USA): ABRNBW

Comparison of Hatching and Broiler Performance between a Synthetic Broiler Parent Stocks and its Original Parent Stocks

Farshid Mazloom Zavaragh[1], Mesut Türkoğlu[2], Okan Elibol[2], BeyhanYeter[3]

[1]*Department of Animal Science, Islamic Azad University ,Maragheh branch, Maragheh, Iran.*
[2]*Department of Animal Science, Faculty of Agriculture, University of Ankara, Ankara,Turkey.*
[3]*Mustafa Kamal University, Turkey.*

ABSTRACT

The attributions related to incubation and production performance of 2 parent stocks are compared in this study. One of these stocks was chosen from a parent stock (ROSS 308) in Hatay region of Turkey in the name of synthetic group. The eggs were gathered from the both stocks in the age of 32-week, at first they were transmitted into incubator and then to saloons. At the end of this period, the incubation attributions (spermatogenesis, incubation efficiency and hatching) of 2 groups showed no significant differences ($p>0.05$).The live weight comparison of original stock to synthetic one showed significant differences after the first week ($p<0.05$) from performance or efficiency of growth period points. Also, there was significant difference from feed conversion (FCR) points ($p<0.05$) and the original stock had a better FCR. Durability of original stock is 4% higher than synthetic stock.

Key Words: Spermatogenesis, Incubation Efficiency, Hatching Power, Live Weight, Feed Conversion Coefficient.

INTRODUCTION

The developments of stock industries cannot be observed in other parts of agriculture during recent 40 years. But the amounts of these developments are not the same in all the countries or have not occurred along a special period of time[1-2]. Todays, Most of the countries depend on other countries for ancestor or parent birds whereas about 10 races of birds are imported and grown in Turkey [3]. There are special lines for production of parent stock which is not identified for all the countries. Therefore, other countries are depended on this limited number of countries and after purchasing parents and passing growth period (23-week) they began to gather spermatogenetic eggs. The production period ends after 40-42 weeks and the birds exit production cycle in the age of 64-week.The supply of parent stocks encounters some problem in each period [4]. For example, if the active companies in theses contexts suffer any kind of disease in stocks, both the parent stock and incubation eggs will be perished and this problem will affect all the parts of stock growth industry. It seems that some researches should be carried

out in reformed and developed lines in order to investigate the other methods of parent stocks supply. This is a fact that the numbers of parent stock supply companies are limited and perform privately. This method does not thoroughly eliminates the dependence on foreign countries but it investigates the necessity of new parent stock supply from the previous stocks in this study in order to guide the coming researches in the context of new parent stock supply.

The aim of this study is to compare the incubation characteristics to efficiency performance related to 2 groups; one of them is parent stock which is imported from Europe to Turkey in the name of ROSS 308 and the other is resulted from the selection and copulation in the same stock in the name of synthetic parent stock.

MATERIALS AND METHODS

The incubation and growth efficiency characteristics of 2 parent stocks are compared in this study. One of these stocks was kept and grown in Hatay as the main stock (ROSS 308) and the other was formed through sequential selections from the same stock and copulations between paternal and maternal lines as the synthetic group.

300 eggs were gathered from every stock in 32-weak and transmitted to incubation saloon. The research site was the stock research field of Ankara University. The gathered eggs were kept in 26□ and humidity of 55% for 12 hours. The 2 incubator machines utilized in this experiment were Chimuka. Then, the eggs were numbered and placed randomly in incubator and their temperature, humidity, rotation and ventilation were tested every day. The eggs were transmitted from covert part to hatchery in day 18 and the primary testing of spermatogenesis was performed. All the hatchlings were gender determined and numbered in day 21. Then, they were weighed and records were written in the related forms. The amount of spermatogenesis, incubation efficiency and embryonic mortality rate were calculated for each group. The chicks were transmitted randomly (from gender points) to saloon and placed in 12 cages (each group in 6 cages). There were 45 chickens in each cage (replica) from the both genders.The stocks were distributed randomly in each pen and even the cages were numbered randomly. The feed formula of this study was prepared according to proposed stock growth notes of ROSS 308 and included 3 periods (beginning: days 0-10, growth: days 11-35 and the final: days 36-slaughter). The grain and water were supplied unlimitedly.

The increased weight, feed conversion and viability were recorder during the experiment. Every chicken of every replica was weighed every week. The feed of each cage was detected and recorded weekly and feed conversion was calculated for each week after weighing. The mortality rate was recorded for each cage daily in order to detect each group's rate of viability. The experiment data were analyzed through SPSS statistical software [5].

RESULTS

1) Incubation Attributions: There was no significant statistical difference between spermatogenesis, incubation efficiency, hatching power and embryonic mortality of 2 groups ($p<0.05$).

Table1. The comparison of incubation period in 2 groups

Attribution/Group	Synthetic	Original	P	Significance
Spermatogenesis	97.67+_ 0.650	99+_0.650	0.177	N.S
Incubation Efficiency	88+1.680	89.70+1.680	0.491	N.S
Hatching Power	90.17+_1.778	90.60+_1.778	0.867	N.S
Embryonic Mortality	6.48+_1.79 0.68+0.54 2.40+_0.77	4.78+_1.79 1.77+_0.54 2.52+_0.77	0.531 0.191 0.917	N.S N.S N.S

2) The Growth Period Attributions: There was no significant difference between 2 groups from chickens' weight point but a significant difference could be observed since the 2nd week, the original group showed increased weight in comparison to the synthetic group ($p<0.05$). Also, the comparison of male and female of 2 groups showed significant difference ($p<0.05$). Significant differences could be observed in comparison of FCR related to 2 groups.

The viability of 2 groups was more than 91% of stocks to the end of this period but the viability of original group was 4% more than the synthetic group.

Table2 Comparison of live weight in different groups.

Attribution/Group	Synthetic	Original	P	Significance
1-day chicken weight	40.46+_0.36	4118+_0.414	0.18	N.S
Average Live Weight of Females	2012+_ 56.0	2215+_29.8	0.023	S
Average Live Weight of Males	2411+_36.3	2617+_69.1	0.031	S
Average Live Weight of Both	2212+_33.4	2416+_37.6	0.029	S
FCR	1.73+_0.0248	1.65+_0.0226	0.032	S

Table3 The comparison of FCR related to 2 groups in different ages

Age/Group	Original	Synthetic
Week 0-1	1.071+_0.014	1.094+_0.015
Week 0-2	1.323+_0.020	1.402+_0.022
Week 0-3	1.417+_0.023	1.525+_0.025
Week 0-4	1.489+_0.026	1.602+_0.029
Week 0-5	1.547+_0.022	1.639+_0.024
Week 0-39	1.655+_0.022	1.739+_0.024

Table4 live weight in different ages

Age/Group	Original	Synthetic
The 1st day weight	41.19+_0.414	40.46+_0.366
The 1st week weight	155.6+_2.63	142.8+_2.32
The 2nd week weight	402.1+_8.69	358.6+_7.71
The 3rd week weight	816.6+_17.61	734.3+_15.60
The 4th week weight	1370+_27.3	1222+_24.3
The 5th week weight	3027+_34.3	1819+_30.4
The final weight	24.16+_37.6	2212+_33.4

DISCUSSION AND CONCLUSION

As it is shown in tables, there was no significant difference between incubation attributions of 2 groups, however the lack of significance does not means the insignificance. Only a difference of 1.33% related to spermatogenesis can be economically significant and considerable. The

spermatogenetic achievements of this study are placed in a higher rank than the opinions of Altan et al. and Akbay et al [6-7].

A decrease can be observed in spermatogenesis of heavy stocks after 40-week and the successful mating decreases too [8]. The spermatogenesis rate of native parents was different 59.60%-96.11%. Akbay and Düzgüneş reached different spermatogenesis of 87.76%-94.81%in various hybrids which were lower than this study's achievements because of the age of parents and egg collection age that was 32-week [9-10].

The incubation efficiency of this study shows no significant differences between 2 groups but is higher than the achievements of Adaligh et al., Inan et al. and Week et al. which means the thorough observation of standards environmental conditions of incubation [11-13].

The hatching rate of this study was 90% more than the rate of ROSS 308 (84.8%)[14-15].

The achievements of this study are lower than the records of Akbay et al. and higher than the records of Özkan et al [9,16-17].

There was no significant difference between 2 groups embryonic mortality. The achievements of this research are compatible with the results of North and Bell [18]. The achievements of Week et al. and Tomova and Wilson do not show much significance in comparison to this study [19-20]. The rate of embryonic mortality in Scott's and Mackenize's research into a strain of broiler in Canada was 8%, which it was lower than the present research [21].

There was no significance performance difference in chickens' weight (2g) during hatching period but each grams difference leads to 2-13g difference at the end of the period[20]. The chickens' weight is usually about 62-78% of the egg [22].

The recorder weight of broiler chickens is about 46.3-41g which is similar to this study's results [19].

The weight of 2 groups showed significant statistic difference at the end of period but the results were much better than the previous results even the synthetic group (weight and short time).

The guidance growth book of ROSS 308 has proposed a mixture weight of 2382g, 2570g for male and 2193g for female in 39-day[14,23]. The performance of original group is higher and the performance of synthetic group is lower than the proposed amount. The weights of both original and synthetic groups were higher than Şenköylü's and et al findings [24].

The utilization of a parent stock's results for synthesis of a new parent stock does not affect the performance so much, the difference is maybe caused by the difference of male and female ratio. The ration of male and female is not equal in both groups. 44.22% of original and 42.81% of synthetic is male which can be the reason of weight increase difference between 2 groups.

FCR related to 2 groups were better than the other researchers' results. Inan et al(11). reached 1-92-2.06 of this attribution rate. The result of this study is compatible with the proposed rate of ROSS 308 (1.68).

There is a high solidarity between FCR and profitability in broiler chickens. The proposed FCR is 1.74 for FCR of broiler hybrids in weeks 0-6. Inan et al. reached 2.01-1.92 rate of this attribution which are higher than the rate of this study [12].

Viability power of this study was lowerthan the previous researches. Some researchers estimated ratios of: Testik et al. (98.35%), Malone et al. (95.15%-96.28%) and Testik and Sarija (94.55%-96.36%) [25-27].

At the end, it seems that new parent stocks can be existed through these methods in demanded conditions and this method can be an alternative for chicken supply of1-day parents. It is proposed to carry out similar experiments on laying parents in order to compare the laying performance efficiency of synthesis and original groups.

REFERENCES

[1] Türkoğlu, M., Zinciroğlu. M., Akbay, R., Elibol, O., Asil, A., **1991**. Broyler üretiminde civciv ağırlığı, cinsiyet yem protein seviyesinin performansa etkileri. Uluslararası Tavukçuluk Kongresi. S:346-354. 22-25 Mayıs **1991**. İstanbul
[2] Türkoğlu, M., Arda, M., Yetişir, R., Sarıca, M., Elibol, O., ve Erensayın, C., **2009**. Tavukçuluk bilimi. Bey Ofset Matbaacılık, Ankara.
[3] Erensayın, C., **1991**. Bilimsel – Teknik – Pratik Tavukçuluk. Tokat.
[4] Hurnik, J.F., Webster, A.B., **1984**. Karlılığın belirlenmesi: Ölüm oranı, canlı ağırlık artışı ve yem tüketimini nisbi etkileri. 17. Dünya Tavukçuluk kongresi, 8-12 Ağustus **1984** Helsinki. Bilmsel Tavukçuluk Derneği Yayınları Ankara, **1985**. Çeviren: Doç. Dr. Rauf Arıkan.
[5] SPSS, 1999. SPSS for Wındows Release 10.01. Spss Inc., **1999**.
[6] Akbay, R., Ülker, M.. Ve Elibol, O., **1995**. Tavukçuluk tüketim projeksiyonları ve üretim hedefleri. Türkiye Ziraat Müh. Teknik Kongresi, Ankara. 771-788
[7] Altan, A., Altan, Ö., Koçak, Ç., **1990**. Etlik piliçlerde farklı aydınlatma yöntemlerinin verim özelliklerine etkisi. Uluslararası Tavukçuluk kongresi 90, 23-25 Mayıs- İstanbul.
[9] Akbay, R., **1974**. Kasaplık piliç yetiştiriciliğinde Cornish x Leghorn melezlerinden yararlanma imkanları üzerinde araştırmalar. A. Ü. Ziraat Fak. Yayınları: 519.
[10] Düzgüneş, O., Akbay, R., **1974**. Türkiye şartlarına uygun broiler ebeveyni elde etme imkanları üzerinde bir araştırma.TAPGEM Yayınları: 16.
[11] Adalığ, H., Yelmen, S., **1990**. Erbeylide geliştirilen anaçlarla dış kaynaklı etçi çeşitli verim özellikleri bakımından karşılaştırılması. Tarım Orman ve Köyişleri Bakanlığı Ülkesel Tavukçuluk projesi Sonuç Raporları. No: 4-163-3
[12] İnan, İ.H., Şenköylü, N., **1990**. Etlik piliçlerde değişik yem kompozisyonlarına göre en karlı kesim yaşının belirlenmesi. Uluslararası Tavukçuluk Kongresi. 90, 23-25 Mayıs- İstanbul. A.Ü.Z.F.Baskı Ofset Ünitesi Ankara. S: 303-310.
[13] Vick, S.V., Brake, J., Walsh, T.J., **1993**. Relationship of incubation humidity and flock age to hatchability of broiler hatching eggs. Poult. Sci. 72/2: 251-258
[14] Anonim., **1990** b. Broiler Breeding Management Guide. Avian Farms Inc.
[15] Anonim., **2008**. Besd-Bir verileri, www.**besd**-bir.org
[16] Akbay, R., CL. **1982**. Akraba hatları arası kombinasyonlarda çeşitli verim özellikleri bakımından heterosis çalışmaları. Akdeniz Üniversitesi Ziraat Fakültesi yayınları. Bilimsel araştırmalar ve incelemeler. S: 487. 1982.
[17] Özkan, S., **1993**. Ticari etlik hibritlerden damızlık olarak yararlanma olanakları. Ege Üniversitesi, Fen Bilimleri Enstitüsü, Zootekni Anabilim Dalı, Doktora Tezi. Bornova-İzmir

[18] North, M.O., Bell, D.D., **1990**. Commerical chicken productin manual. 4th edition. An AVİ Book. New York.
[19] Tomova, O., **1970**. *Anim. Breed. Abst.* No: 4281
[20] Wilson, H.R., **1991**. *World's Poult. Sci.* 62: 1133-1141.
[21] Scott, A.J., Mackenize, C.J., **1992**. *Poult. Sci. Supplement* 71/1, Abst. No: 16.
[22] Shanawany, M.M., **1987** *World's Poult. Sci*. J. 43: 105-107.
[23] Ross, **2007**. Broiler performance objectives. Scotland U.K.
[24] Şenköylü, N., **1995**. Modern tavuk üretimi. Trakya Üniversitesi, Ziraat Fakültesi, Zootekni Bölümü, 2. Baskı, Tekirdağ. 469.
[25] Malone, G.W., Chaloupka, G.W., Merkley, J.W., Littlefield, L.H., **1979**. *Poult. Sci.* 58: 509-515
[8] Yang, N., Shan, C., **1992**. Housing broiler breeders in China: cage vs floor. 19. World's Poult Congress, Amsterdam. Vol:2, P: 340.
[26] Testik, A., Sarıca, M., **1987**. Ç.Ü. Ziraat Fakültesinde geliştirilmekte olan etlik piliç ebeveynlerinin döllerine ait performanslar ve bunların dış kaynaklı ticari hibritlerle karşılaştırılması. Doğa Veterinerlik ve Hayvancılık Dergisi Cilt: 11 Sayı:1, 90-99
[27].Yeter, B., **2010**. Sürdürülebilir broyler ebeveyn üretimi. Mustafa Kemal Üniversitesi. Fen Bilimleri Enstitüsü, Zootekni Anabilim Dalı, Doktora Tezi. Antakaya- Hatay