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EFFECT OF CROSSING ON THE PRODUCTIVITY OF DUCKS

II.—Carcass Characteristics

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This work was carried out on two purebred groups of ducks Pekin and Khaki Cambell and their reciprocal crosses to study the effect of crosing on meat production. The main results arrived at were as follows:

1. The eviscerated percentage ranged from 68.69% in P to 76.50% in KP at 12 weeks of age, and from 64.43% in K to 69.41% in P at 24 weeks of age. The crossbreds had higher dressing percentage than the parental breeds in all the ages studied. The crosses KP had higher dressing percentage than its reciprocal crosses.

2. Sex proved to be of no effect on dressing percentage at all ages studied.

3. The Pekin breed had higher edible parts than K breed. (1.162 vs. 824 Kg at 12 weeks of age and 1.135 vs. 837 Kg. at 24 weeks of age). The crosses PK and KP had almost the same weight of edible parts (1.242 and 1.067 Kg. at 12 weeks of age and 1.147 and 1.117 Kg. at 24 weeks of age).

4. With respect to breast meat at the 12th weeks of age the P had the highest weight of breast meat (617 grams) and the K have the lowest (465 grams), the same was true at the 24th weeks of age (685 grams for P and 473 grams for K). The two crosses had almost the same weight of breast meat at 24 weeks of age, (the figures at 12 weeks of age were 683 grams for KP and 599 grams for PK). No sex difference was observed with respect to this character.

5. The weight of legs was higher in crosses than purebreds at 12 weeks of age; K giving the lowest weight (272) grams. The same was true at 24th weeks of age (331, 381, 337 and 279 grams for P, KP, PK and K respectively).

Meat production from ducks is hindered by the low fecunidty of female ducks bred for meat production. In this tudy, one breed representing meat production ducks was crossed with an egg producing breed to study its effect on meat production.

Horn et al (1952), and Dahnovskii (1961) found that carcass characteristics were better in crossbred than in the purebreds. Rudolph (1965) found that the dressing percentage at 8 weeks of age in crossbred Call drakes (Docoy) with Pekin ducks was slightly higher than the Pekin (70% vs. 69%). Sivicki (1956) noticed that crosses between Barazilian drakes (Muscovy) and Domestic ducks had slightly better carcass percentage than barazilian breed (82% vs. 80%). Pop and Georegescu (1964) found than the two reciprocal crosses between Pekin and Khaki-Campbell produced higher percentage of edible meat as compared with their parental breeds.

Dakhnovsky (1962) found that crosses between Pekin and Ukrianian Grey, Ukrianian Cloy, Ukrianian White and Black gave higher commercial carcass quality than the pure breeds. Mauch and Boian (1958) found that crosses between Pekin and Muscovy gave more rounded body and higher percentage of topgrade carcasses than either parental strains.

Sex is one of the factors which influence carcass quality. Faber (1961) showed that differences between males and famales become more pronounced with the increase of age. Males attained better carcass quality at an earlier age than females.

Materials and Methods

On December 1965 the following four mating were done using 15 drakes and 50 ducks in each : pure Pekin (P), pure Khaki - Caupball (K), P male K females (PK offspring) and K males XP females (KP offspring). The duckling were brooded and reared under the same managemental conditions.

The ration of the ducklings consisted of 25% corn, 25% rice bran, 10% wheat 10% broad beans, 25% wheat bran, 5% cotton seed meal. The ration, was also supplemented with 1.5% lime stone, 1% sodium cloride, 0.1% Terramycin, 0.2% Vitamin A+D_3 and 3% skim milk or fish meal. The mash was mixed with skim milk when offered to the ducklings at the brooding stage. Green fodder was supplied as Egyptian clover in winter, and green corn leaves in summer. Three females and three males were used to study carcass characteristics at each of the 4 ages 12, 16, 20 and 24 weeks. The carcass characters studied included the eviscerated weight (neck + wings + back + breast + legs + giblets) giblets (liver and gizard) and the weight of edible parts (breast meat, legs meat and giblets).

Analysis of variance was calculated for the different characters to test the differences between the different groups.

Results and Discussion

The average body weights of both purebred and crossbred birds used in this study during the period from 12 to 24 weeks indicated that the Pekin have the highest body weight, the crosses were of intermediate body weights between their parents and the Khaki-Campbell had the lowest weight. (Table 1).

Eviscerated percentage increased for all the groupas from 12 weeks until 20 weeks of age. It seems that the body matured at the age period from 12 to 20 weeks of ages when the eviscerated percentage decreased afterwards (Table 1). Also, Harshow and Robert (1940) observed that the percentage of dressed weight to live weight increased with age of chickens. No sex differences were observed in this respect, sex proved to be of no effect as shown also by Rudolph and Fritsche (1955) in ducks. The two crosses had better evisceration than their parents. However, the PK was somewhat of better evisceration than the other cross. Rudolph (1965) found that the crosses have higher dressing percentage than the parental breed.

TABLE 1.—AVERAGE BODY WEIGHT EVISCERATED WEIGTH AND EVISCERATED PERCENTAGE

Breeds and Crosses	Items	AGE IN WEEKS											
		12			16			20			24		
		M.	F.	M.F.	M.	F.	M.F.	M.	F.	M.F.	M.	F.	M.F.
P	Body weight (Kg)	2.137	2.085	2.111	2.100	2.168	2.143	2.263	2.243	2.253	1.958	2.191	2.024
	Eviscerated weight (Kg)	1.444	1.457	1.450	1.478	1.494	1.490	1.603	1.291	1.297	1.369	1.441	1.405
	Eviscerated %	67.57	69.88	68.69	70.81	68.91	69.82	70.84	70.93	70.88	69.91	65.76	69.41
KP	Body weight (Kg)	1.858	2.040	1.249	1.981	1.750	1.865	1.868	1.858	1.865	2.090	1.980	2.033
	Eviscertated weight (Kg)	1.334	1.646	1.491	1.419	1.269	1.344	1.498	1.387	1.332	1.386	1.415	1.402
	Eviscertated %	71.96	80.69	76.50	71.63	72.53	72.66	74.84	74.65	74.71	66.31	71.61	62.96
PK	Body weight (Kg)	1.916	1.776	1.846	1.815	1.670	1.742	1.791	1.721	1.856	1.935	1.916	1.925
	Eviscerated weight (Kg)	1.383	1.294	1.338	1.291	1.195	1.243	1.422	1.288	1.355	1.346	1.288	1.292
	Eviscerated	77.18	72.86	72.48	71.13	71.56	71.35	71.42	74.84	73.00	69.56	69.61	67.11
K	Body weight (Kg)	1.243	1.490	1.216	1.686	1.264	1.624	1.511	1.265	1.238	1.650	1.550	1.600
	Eviscerated weight (Kg)	1.046	1.068	1.057	1.195	1.124	1.514	1.149	1.054	1.101	1.097	0.966	1.031
	Eviscerated %	67.79	71.68	69.72	70.88	71.91	71.06	76.04	67.33	71.59	66.40	63.32	64.43

M. = Males F. = Females M.F. = Both sexes.

Edible parts :

Although there are significant age differences with respect to edible parts, yet not clear age trend can be detected. This also adds to what war observed in eviscerated percentage that the body of duck matured during the period from 12 to 20 weeks of age. No sex differences were observed in this respect (Table 2).

The different values of the edible parts were highest for P and KP in all ages while the KP had intermediate values and K had the lowest ones (Table 2). This may be due to that the P and KP had also the heavier body weights for all the ages studied. Mulsow (1964) also observed that the birds that have heavier body weight have also larger carcass of good quality than the lighter birds The differences between breeds and crosses and between ages were significant (Table 5). Also, Pop and Georgescu (1964) observed significant differences between purebred and crossbred ducks with respect to the weight of edible patrs.

Breast Weight :

The lightest breast weight meat weight and percentages of meat in breast was observed at 16 weeks of age and then the values were almost constant in all the 4 groups. The formation of meat on breast seems to attain maturity at this age or the subsequence ages from 12 to 20 weeks of age as previously observed in the carcass in general (Table 3). In the work of Harshow and Robert (1940) on chicken they also observed that quantity of breast meat incresed with the advancement of age.

K birds had the lightest breast, breast meat and meat percentage. Pekin birds had the heavier breast weight. However, the two crosses although having medium weights of breast weight or breast meat, yet, they had the highest values of meat percentage. It seems that crossing encouraged the formation of meat more than the parent purebreeds irrespective to body weight trends. However, Mulsow (1964) observed that breast weight is correlated with body weight. The emales of K P and K had higher breast values than the males and the differences were significant. Mulsow (1964) observed a significant difference between drakes and ducks in breast meat. Meanwhile P and P K showed the same values in both sexes. Rudolph and Fritsche (1965) found no significant differences between males and females in breast meat in chickens

Legs weight :

Comparing the four breeds and crosses for legs weight at 12 weeks of age the mean of both sexes showed that the two crosses were higher than the two purebreds and K was the lowest (Table 4). Pop and Georges cu (1964) using the same breeds and crosses found similar results. Comparing the weight of legs, legs meat weight and meat percentage at the different ages it is clear that there is no appreciable difference between the ages studied showing that body tissues matured during this period. The trend in legs meat

TABLE 2.—AVERAGE WEIGHT OF EDIBLE PARTS AND THE PERCENTAGE OF EDIBLE PARTS TO LIVE WEIGHT AND TO EVISCERATED WEIGHT

Breeds and Crosses	Items	AGE IN WEEKS											
		12			16			20			24		
		M.	F.	M.F.	M.	F.	M.F.	M.	F.	M.F.	M.	F.	M.F.
P	Edible weight (Kg)	1.155	1.169	1.162	1.234	1.252	1.243	1.294	1.323	1.308	1.117	1.153	1.135
	Edible/live weight %	54.05	56.07	58.67	55.05	58.76	55.52	57.14	58.98	58.06	57.04	52.62	56.07
	Edible/eviscerated weight %	79.94	80.23	80.14	82.99	83.80	83.42	80.72	83.16	81.90	81.58	80.01	80.78
KP	Edible weight (Kg)	1.065	1.422	1.242	1.173	1.028	1.100	1.135	1.126	1.130	10.12	1.174	1.147
	Edible/Live weight %	75.21	69.71	63.72	59.21	58.74	58.89	60.76	60.60	60.62	53.82	59.29	56.51
	Edible/eviscerated weight %	79.51	86.39	83.30	82.66	81.01	81.85	81.19	81.18	81.18	81.17	82.51	81.95
PK	Edible weight (Kg)	1.106	1.029	1.067	1.063	0.988	1.026	1.149	1.030	1.089	1.101	1.133	1.117
	Edible/live weight %	57.72	57.94	57.52	58.62	59.16	58.95	57.71	59.82	58.67	56.89	59.13	58.02
	Edible/eviscerated weight %	79.97	79.52	79.75	82.42	82.68	82.54	80.80	79.97	80.37	81.80	91.52	86.46
K	Edible weight (Kg)	.805	.843	.824	1.011	.911	.960	.896	.859	.877	.896	.778	.837
	Edible/live weight %	52.17	56.58	54.35	59.90	58.29	59.11	59.30	57.89	57.02	54.30	50.19	52.31
	Edible/eviscerated weight %	76.96	78.93	77.96	84.52	81.05	83.19	77.98	81.20	79.65	81.68	80.54	81.18

M. = Males F. = Females M.F. = Both sexes.

TABLE 3C.—AVERAGE WEIGHT OF BREAST AND BREAST MEAT AND THE PERCENTAGE OF MEAT IN THE BREAST

Breeds and crosses	Items	AGE IN WEEKS											
		12			16			20			24		
		M.	F.	M.F.	M.	F.	M.F.	M.	F.	M.F.	M.	F.	M.F.
P	Breast weight (grams)	823	823	823	925	965	895	966	936	951	905	891	898
	Brast meat wt. (grams)	613	620	617.5	744	686	715	757	759	798	691	681	665.5
	Meat %	74.73	74.73	75.33	75.03	80.43	79.31	79.89	78.95	78.65	76.24	76.43	76.34
KP	Breast weight (grams)	808	935	871.5	841	741	791	853	806	829.5	850	865	837.5
	Breast meat wt. (grams)	598	769	683.5	659	589	624	655	611	633	654	685	668.5
	Meat %	74.01	82.25	78.43	78.36	79.49	78.89	76.79	75.81	76.31	76.94	78.96	77.96
PK	Breast weight (grams)	808	791	799.5	783	743	763	865	793	829	838	798	793
	Breast meat wt. (grams)	600	598	599	620	585	602.5	664	595	629.5	655	702	689.5
	Meat %	74.26	75.60	74.92	79.18	78.73	78.93	76.76	75.03	75.93	78.16	93.83	85.56
K	Breast weight (grams)	615	626	620.5	648	673	685.5	621	613	617	656	583	619.5
	Breast meat wt. (grams)	445	485	465	558	517	537.5	473	473	473	505	442	473.5
	Meat %	72.36	77.48	74.94	79.94	76.82	78.41	76.17	77.16	76.66	76.98	75.81	76.43

M. = Males F. = Females M.F. = Both sexes.

TABLE 4.—AVERAGE WEIGHT OF LEGS AND LEGS MEAT AND THE PERCENTAGE OF MEAT IN LEGS.

Breeds and crosses	Items	AGE IN WEEKS											
		12			16			20			24		
		M.	F.	M.F.	M.	F.	M.F.	M.	F.	M,F.	M.	F.	M.F.
P	Legs weight (grams)	480	500	490	431	498	194.5	475	593	499	375	433	404
	Legs meat weight (grams)	399	420	409.5	363	435	399	400	453	426.3	303	359	331
	% of meat in legs	83.13	84.00	83.57	84.22	86.35	85.90	83.21	86.62	85.47	80.86	82.91	81.9
KP	Legs weight (gram)	406	586	496	446	398	422	450	473	481.5	438	451	444.5
	Legs meat weight (grams)	343	520	435.5	384	343	363.5	385	408	396.5	373	389	381
	% of meat in legs	84.48	90.10	87.80	86.10	86.18	86.14	86.56	56.26	85.92	85.16	86.25	86.71
PK	Legs weight (grams)	448	410	429	391	353	372	460	398	429	406	388	397
	Legs meat weight (grams)	379	338	358.9	331	302	316.5	391	338	364.5	355	329	337
	% of meat in legs	84.60	82.44	83.57	84.65	85.55	85.08	85.00	84.92	84.97	84.98	84.79	84.89
K	Legs weigh (grams)	331	331	331	388	353	370.5	388	360	374	351	303	327
	Legs meat weight (grams)	269	281	272.5	344	296	320	340	305	322.5	302	256	279
	% of meat in legs	79.76	84.89	82.33	88.66	83.85	86.37	87.63	84.72	86.23	86.04	84.49	85.32

M. = Males F. = Females M.F. = Both sexes.

weight coincided with the trend in body weight of breeds and crosses studied. K P had the highest value and K had the lowest. Mulsow (1964) also found a significant correlation between body and legs meat weights in chicken.

Comparing the meat percent in legs in the 4 breeds and crosses at 12 weeks of age, it could be seen that ,apart from KP which ranked the first the other have almost the same percent. The percentages of meat in legs in the three other ages studied were almost the same for all birds. The analysis of variance (Table 5) shows also that there are no significant differences between breeds and crosses with respect to this character.

TABLE 5.—F. VALUES FOR CARCASS CHARACTARISTICS.

Sources of variance	d.f.	Eviscerated weight	Edible parts weight	Breast meat weight	Legs meat weight
Between ages	3	8.37**	5.98**	5.73**	1.68 NS
Within ages between sexes	4	1.53 NS	2.80 NS	2.94*	.74 NS
Within ages between breeds	12	2.48**	2.09*	.72 NS	1.10 NS
Error	76	—	—	—	—

* Significant (at 5% level).

** Highly significant (at 1% level).

NS not significant.

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تأثير الخلط على انتاج البط
٢ ــ صفات الذبيحة

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الملخص

اجريت هــذه التجربة على نوعين من البط هى البكين والكاكى كامبل والخليط بينهما لدراســة تأثير عملية الخلط على انتاج اللحم وكانت اهم النتائج المتوصل اليها هى :

١ ــ نسبة التصافى كانت تتراوح بين ٦٩ر٦٨٪ بالنسبة للبكين الى ٥٠ر٧٦٪ بالنسبة لخليط الكاكى كامبل × البكين عند ١٢ أسبوع من العمر . وكذلك كانت تتراوح نسبة التصافى بين ٤٣ر٦٤٪ بالنسبة للكاكى كامبل الى ٤١ر٦٩٪ بالنسبة للبكين عند ٢٤ أسبوع من العمر .

كانت نسبة التصافى بالنسبة للخليط أعلى منها بالنســبة لكلا نوعى الآباء فى كل أعمار الدراسة . بالنسبة لخليط الكاكى كامبل × البكين كان يعطى أعلى نسبة تصافى مقارنا بالخليط الآخر .

٢ ــ لم يظهر اى تأثير للجنس على نسبة التصافى فى كل اعمار الدراسة .

٣ ــ بالنسبة للجزء المأكول كان البكين يعطى وزنا أعلى من الكاكى كامبل (١٦٢ر١ ــ ٨٢٤ر كيلو جرام عند عمر ١٢ أسبوع بالنسبة للبكين على التوالى والكاكى كامبل ، ١٣٥ر١ ــ ٨٣٧ كيلو جرام عند عمر ٢٤ أسبوع بالنســبة للبكين والكاكى كامــل على التوالى) .

كان وزن الجزء المأكول بالنسبة للخليط متســاوى تقريبا عند عمر ١٢ ، ٢٤ أسبوع (٢٤٢ر١ ــ ٠٦٧ر١ عند ١٢ أسبوع ، ١٤٧ر١ ــ ١١٧ر١ كيلوجرام عند ٢٤ أسبوع بالنسبة لخليط البكين × الكاكى كامبل ــ خليط الكاكى كامبل × البكين على التوالى) .

٤ ـ بالنسبة لوزن الجسم فى الصـدر كان البكين يعطى أعلى وزن (٦١٧ جرام) ـ والكاكى كامبل يعطى أقل وزن (٤٦٥ جرام) ونفس النتائج كانت متماثلة تقريبا عند ٢٤ أسبوع (٦٨٥ جرام بالنسبة للبكين ، ٤٧٣ جرام بالنسبة للكاكى كامبل) . وبالنسبة للخليط كان يعطى تقريبا نفس الوزن للحم فى كلا نوعى الخليط عند عمر ٢٤ أسبوع أما بالنسبة لعمر ١٢ أسبوع فكانت الأوزان كالآتى : ٦٨٣ جرام بالنسبة لخليط الكاكى كامبل × البكين ، ٥٩٩ جرام بالنسبة لخليط البكين × الكاكى كامبل كما أنه لم يكن هناك اى تأثير للجنس على وزن اللحم فى الصدر .

٥ ـ كان وزن الأرجل فى الخليط أعلى منه مقارنا بنوعى الآباء عنـد ١٢ أسبوع من العمر وكان الكاكى كامبل يعطى أقل وزن (٢٧٢ جرام) ونفس النتائج كانت تقريبا عند ٢٤ أسبوع (٣٣١ ـ ٣٨١ ـ ٣٣٧ ـ ٢٧٩) جرام بالنسبة للبكين ـ خليط الكاكى كامبل × البكين ـ خليط البكين × الكاكى كامبل ـ الكاكى كامبل على التوالى) .