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## **Productivity of Khaki Campbell Ducks (*Cairina moschata*) under the Local Agricultural Produce and by Products in the Breeding Conditions of Brazzaville-Congo**

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**Abstract:** The possibilities of adaptation and exteriorization of production and reproduction performance of Khaki Campbell stump of ducks in breeding conditions of Brazzaville in Congo have been studied. Two homogeneous groups of Khaki Campbell have been constituted. The witness group has been subjected to diet A food which is composed by local agricultural produce and products and Mineral Azoth Vitamin Complex (CMAV). Diet B is only composed by local agricultural produce and products. Without animals proteins has been administered to experimental group. The difference of weight has not been significant. Talking about the intensity of lay, a really significant difference has been recorded to ducks subjected to diet A. The egg weight in these two diets (A and B) has been similar. The consumption of food per egg has been inferior in diet A. The accumulated portions have been equivalents compared to live weight. The carcass weight and fat liver did not record significant difference. The abdominal fat weight has been significant in diet B. This study contributes in diverse strategies of improvement of ponder growth and ducks eggs production and the development of poultry farming in Congo on the one hand and the other hand profit breeding only through local agricultural products without using the mineral azoth vitamin complex.

**Key words:** Khaki campbell duck, productivity, adaptation, Congo

### **INTRODUCTION**

In Congo the exploitation of operator's possibilities of private sector as a matter of fact countryman, the family, the modern private, the cooperative, agricultural group and at last local collectivities, should contribute to national production effort of foodstuffs. For increasing the Consumption rate of proteins from animal; the poultries have been retained on the basis of two things: their speed growth and their importance toward foods habits of Congolese.

Talking about objectives of self-food sufficiency of Congo fixed by the national council of agriculture on the one hand and on the other hand to reduce food charges in poultry breeding, we have registered the small privates agricultural groups, animals species with short cycle of production based essentially on agricultural produce and products and also based on local agro industrial (hyacinth of water, rests of harvesting, cassava and its rests, rest of groundnut, brewery rest and knife grinder (CNA, 2000. T2).

In the development research case, we did a food trial of fertile ducks belonging to Khaki Campbell stump. Based on the preoccupation of making value local agricultural produce and products and afro-industrial has been put in evidence. This stump has been imported from England where it is known by its high production which reaches an average from 280-320 eggs per year (Baeza *et al.*, 2005; Berri and Wacrenier, 2001).

This study has for aim the analysis of some growth

performances, production, reproduction and corporal composition.

Indeed, Since about more than twenty years, Congolese's breeders have given themselves a dowry to poultry production, pig and rabbit systems broadly tributaries of a classic food. One part of ration ingredients such as food complements and biological concentrated of synthesis which stimulate animal production to stay imported. This study has an economic interest as a matter of fact the promotion of local production of those ingredients. The raw materials which intervene to the fabrication of those ingredients are available. Thus, for knowing the effectiveness of local products, the mineral azot vitamin Complex (CMAV) has been incorporated in a food diet by the aim of comparison.

### **MATERIALS AND METHODS**

**Study area:** The present trial has been done during 302 days in station, in conditions which are presented in the Table 1.

**Experimental protocol:** The study pointed on the ducks of a year day, of Khaki Campbell race, imported to England. During the starting period, ducklings have been bred until two weeks on the litter of 15 cm of thickness in a warmed ducklings' house on 30 m<sup>2</sup> and fed until eight weeks by the starting industrial food. The chemical composition of this food has been 22.5% of

Table 1: Climatically condition that during trial period

Months	April	May	June	July	August	September
	1	2	3	4	5	6
Middles temperatures:						
Max	38.8	30.8	29.2	27.5	29.2	31.3
Min	21.1	20.9	18.4	16.0	19.5	20.0
Middle	26.1	25.8	23.8	21.7	24.3	25.6
Precipitation in mm	143.5	80.2	1.3	-	30.6	65.4
Days numbers	12.0	13.0	1.0	-	3.0	2.0
Relative humidity, %	82.2	84.8	83.8	82.4	77.4	76.5

Table 2: Diets composition of ducks studied

Ingredients	Witness diet (A)	Experimental diet (B)
maize	20.18	21.06
Knife-grinder	15.14	15.05
Rests of brewery	15.14	15.05
Cassava	34.30	30.10
Rest of groundnut	-	10.50
Fish flour	-	-
Phosphate bi calcique	-	1.20
Oyster shell	3.14	5.84
Sodium	-	0.21
Usine	-	0.26
Methionine	-	0.15
Palm-oil	-	0.60
CMAV, 12-15*	12.1	-
Total	100.0	100.0
<b>In 100 g of food. we have: **</b>		
EM, Kcal	261.7	260.7
MPB.%	14.0	14.1
MG, %	-	-
MC, %	6.17	6.22
Ca, %	2.73	2.71
P, %	0.59	0.62
Na, %	0.30	0.15
Amino acid, mg	287.2	712.1
Methio + cystine	245.6	561.7
Tryptophane	133.5	165.3

\*Food value of CMAV 12-15%:

\*\*In 100 g we have: 220 Kcal of EM; 40% of MPB; 1.5% of MG; 4% of MC ; 6% of Ca; 2% of P; 2% of Na. Those values do not take into account the quantities of amino acid of CMAV 12-15%, because those values have not given to us on technical card.

raw protein material, 3% of fat materials of cellulose materials and 6% of mineral materials.

From the eighth to the entrance of production (or lay) precisely in 25 weeks, ducklings have occupied the area of 50 m<sup>2</sup> covered (claw) and have received a young hen food in which the nutrient value was like this: in 100 g, we count 275 Kcal of metabolism energy, 14% of raw proteins materials, 2,5 of fat materials, 5% of cellulose, 0.9% of calcium and 0.5% of phosphorus. In this breeding period, the growth and ponderals parts have been valued.

At 25 weeks of age, starting period of producing, ducks have been separated in two experimental groups of 55 subjects per duck with a ratio-sex of a male for 4 females. They have been profited a claw of 50 m<sup>2</sup> covered with a plastic layer of black color. Two hen-houses of 25 m<sup>2</sup> have been thus created for each group. Each hen-house has disposed three eating linear of 2m,

11 nests and with one playground of the same size than the hen-house.

The play ground has sheltered three siphoides watering-places of 10 liters and a basin of 4.5 m<sup>2</sup> and 0.5 m of depth, dug specially in order to get a best copulation or fertilization.

The experimental phase of this work which is corresponded to the production period puts in comparison two experimental diets (Table 2).

- One witness (diet A) with a biological concentrated in particular the mineral azot vitamin complex (CMAV 12-15%) of the incorporation rate of 12,1%
- One experimental (diet B) without CMAV 12-15% in which lysine and methionine of synthesis have been integrated. Over-wise this diet is completed by will by hyacinths of water, the rests of harvesting and diverse grasses available in Congo. Thus, at the end of 302 days (43 weeks) the zoo technical performance and the corporal composition of ducks have been equally analyzed.

**Statistic treatment:** Some experimental results have been under a statistic treatment by Excel with the test of Student-Fisher for the averages comparison.

## RESULTS AND DISCUSSION

**Zootechnical performances for ducks:** The middle live weight of ducklings, at the end of breeding period has been 1800±87 g with a daily middle consumption of 88.8 g, per duckling (Table 3).

During lay period ducks have given a weight of 1760±151.6 g and 1715±159.5 g respectively for witness and experimental diets (Table 3).

This indicates a same walk of getting weight because there is not the significant difference. This down ponderal weigh in lay period by comparison with breeding period is essentially caused by an intensity of lay.

Which mobilize a part of nutritious matters of organism accumulated during a breeding period of eggs production, reason why we have got a high weight during a breeding time more than lay one (Baeza *et al.*, 2005). Observations realized to hens and ducks suggest that an effectiveness feeding is associated to a low outer grease (Alleman *et al.*, 1999). There are authors who believe that the capacity for having grease depend on

Table 3: Zootechnical performances of studied ducks

Parameters	Breeding period	lay period	
	(174 days = 25 weeks)	Witness diet (A)	Experimental Diet (B)
Live weight, g	1800±87	1760 ±151.6	1715 ± 159
Mortality	-	6.5	8.7
Foods consumption g/day/head	88.8	238±40.5 (*)	219.4±31.3
Lay rate (intensity), %		54.3±5.5 (*)	26.8±5.3
<b>Cumulated lay, unities:</b>			
Per duck lodged		82.4 (*)	42.6
Per duck present		86.4 (*)	42.6
Eggs weight, g		65.8±10.2	64.2±7.4
Consumption of foods per eggs, kg		0.477 (*)	0.868

(\*) p<0.05-0.01-Significative difference between the averages of diet A and diet B

genes (Picard, 1986; Guy and Hermier, 1999; Berri and Wacrenier, 2001; Chartrain *et al.*, 2004).

Ducks nourished without Mineral Azoth Complex (CMAV) show a rate death of 8,7% whereas 6,5% has been recorded to ducks nourished with Mineral Azoth Complex (CMAV).

We notice that the day consumption of feed per duck of 238.7±40.5 g to those ducks of diet A against 219.4±31.3 of diet B.

The difference between both of them was not enough. This consumption still linked by becoming fat at almost the same level in these two groups.

As regard lay intensity, we notice the high difference (p<0.005) of ducks of diet A compared to ducks of diet B, with a rate of 54,3±5,5% against 26,8±5,3%. The same thing is notice to the layer per duck inside (82,4% and 42,6% ° and presented(82,4% and 42,6%).

This low rate of lay notices to ducks of diet B, without CMAV indicates the low nutritious value of animals proteins ration in spite of adding an amino acid synthesis ; the explanation given to this situation can be the missing of high energetic foods into the ration such as the rest of soya beans and blood flour. It is important to avoid to neglect the environment conditions that we less master, as far as Khaki Campbell stump is concerned precisely the relative humidity which is around 80%.

A poor ration at Mineral Azoth Vitamin Complex (CMAV) does not improve eggs production and mostly in sunny countries where organisms ask a high mobilization of energies (Baeza *et al.*, 2005).

The egg weight coming from those two diets food did not present a significant difference (65,8±10,2 g and 64,2±7,4 g) whereas the indicate consumption to egg of witness diet has been inferior than the experimental diet one by around twice. The results of 3 and 4 Tables indicate a big sensibility of lay to industrial biological concentrated, precisely the Mineral Azoth Vitamin Complex (CMAV).

This sensibility seems to be linked to a low balance of diet B; diet without animal's proteins, thanks to principals actives of oligo elements, vitamins, amino

acids, basically amino acid digestible seems to be more critical tropical rations than their natural proteins rate. The deficiency of lysine affects more performance than diet which is on the other hand exceed in protein (Picard, 1986). Criterion of choice for incorporation those actives substances will be found in their influence on food cost and the incoming price of production.

The results which have been got on foods consumption presented also that, it should be better to make easy something like two and four days respectively to witness groups (A) and experimental (B) in order to get an egg at the end. Those high food consumption should be the fact of presenting them under flour form.

**Corporal composition of ducks:** Some accumulated parts of carcass have been weighed (Table 4). The carcass weight, the abdominal fat weight and fat liver have been the object accumulated parts analysis during breeding and lay period to subject or each food diet. During breeding period the weight of carcass has been 1202 ±21 g. Whereas the abdominal grease and fat liver have given respectively 16,3 g and 40,4 g (Table 4). The carcass weight has been valued at 1070±80 g and 1050±110 g respectively in A and B diets. The outputs of carcass were about 61%. The abdominal fat been 21±0,8 g in diet A and more high in diet B (28,3±4,7 g) whereas fat liver represented 56±6,6 g and 52,2 g respectively. The percentages of abdominal fat in keeping with alive weight were consummated to their live weight, they represented an under skin and abdominal important fattening and the fat liver increases (Baeza *et al.*, 2005; Blum, 1993). It is equally indicated that liver formation of skin less effective to animals which belong to thin descendants (Alleman *et al.*, 1999). Baeza *et al.* (2005) indicate that among types of ducks which exist, only Barbarity and Mulard ducks which are used for producing fat liver.

Some authors estimate after hydrolyze of foods in alimentary canal and absorption, lipids are transported by portal blood thanks to protomicrons until liver as also great quantities of glucose. It follows an intense liver formation of skin (Hermier *et al.*, 1999; Chartrain and Mourt, 2003). Indeed, the duck, by walking without bill in

Table 4: Corporal composition and carcass's yield of studied ducks

Parameters	Breeding period	Lay period	
	(174 days) =25 weeks	Witness diet (A)	Experimental diet (B)
Live weight, g	1800 ± 87	1760.0 ± 151.6	1715.0±159.5
Weight of carcass	1202 ± 21	1070.0±80.0	1050.0 ±110.0
Yield,%	66	60.6	62
<b>Weight of fat</b>			
abdominal, g	16.3	21.0±0.8	28.3±43
Weight of liver	40 g	560±6.63	52, 2±7.6

order to choose what it needs, occasions no doubt an importance loss of foods when these foods are in flour state. The loss of foods could be decreased if these foods are presented by pasty form and nevertheless cooked (or prepared) and distributed three times per day, in morning, in noon time and in evening, this in order to avoid an eventual fermentation and consequently some poisoning.

Compared to the results which have been got in 128 days of lay, it would desirable to:

- Enrich after that period, diet B (diet without animals proteins) by an industrial concentrated without azoth of 1% and check in our trial conditions, the satisfactoriness results already recorded by Branckaert and Vallerand (1973), Picard *et al.* (1993), as regard rations without animals proteins for animal food intertropicals areas.
- Present foods for ducks under pasty form in order to reduce their loss in consummation.

By comparing our results which have been got to performances of stump subjected to standard diet, these results are widely underneath.

Indeed, created in 1901 by Madam Campbell of Utleigh (Gloucestershire), in England, from wild duck, of Indian runner sandy of dark and white and Rouen. During the establishment of first standard, the calorie is not taken in consideration: Madam Campbell employed herself for producing a lay duck. And this last had glory hour in the beginning of century, because it was obviously a real "machine for lay" eggs of 85 g, in shell from white to Drake weights 2.5 kg and duck 2 kg. So it is not a big race but it is all right because the best layers ducks are not indeed big animals.

Until a new period, this duck race was called "Khaki Campbell" or "Khaki" but since the appearance of white variety (race) the retained name is "Campbell" "Campbell Khaki" or "Campbell white", according to the variety.

The imported improved ducks of Khaki Campbell stump, according to our trial, these ducks can adapt and exteriorize their growth performances, of lay in Sunny and humid area, if only breeding and food conditions are improved.

The using of rations which have not animal's proteins does not improve ducks productivity. However, the value

of local agricultural and agro industrials stay a national imperative in food stuffs production. It imports to Search for the sources of local animals proteins which are available at feeble cast in order to balance rations.

A part from all, the duck is considers like a poultry species able to value poor foods, but the incorporation of mineral azoth complex in food ration stays something which brings a solution in rations unbalanced in sunny countries where breeding conditions require an improvement.

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