GROWTH OF BROAD-NOSED CAIMAN, *Caiman latirostris* (DAUDIN, 1802) HATCHLINGS, FED WITH DIETS OF ANIMAL ORIGIN

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ABSTRACT

The study was carried out to evaluate the growth rate of broad-nosed caiman, *Caiman latirostris* hatchlings, fed on four animal protein diets: (a) dead poultry from a poultry farm; (b) dead piglet from nursery and farrowing house in a swine farm; (c) whole tilapia (*Tilapia rendalli* e *Oreochromis niloticus*); and (d) a balanced mixture of a, b, and c sources. Sixteen seven-month old caimans, average weight of 208 g and, 38 cm of total lenght (TL) were distributed in four treatments. Four groups of four caimans each were placed in cement enclosures inside a greenhouse. Diets were supplied at the average rate of 97.8% ± 34.8% of the body weight per week (average and standard deviation; wet weight basis). Body mass and total length of caimans were measured every 30 days for six months (Nov. 1995-April. 1996). An analysis of variance with repeated measures was performed. Diets provided suitable growth for weight and TL (mean ± standard deviation, respectively): (a) 2,157 ± 743 g and 79.5 ± 6.9 cm; (b) 1,811 ± 222 g and 75.7 ± 1.9 cm; (c) 2,431 ± 780 g and 80.7 ± 5.8 cm; (d) 1,683.5 ± 736 g and 74.5 ± 7.2 cm. There was no significant effect of diet on weight, but diet effect on TL of hatchlings approached significance ($p < 0.10$). It is concluded that all diets have good potential, in growth sense, to be used in commercial farms or ranches and for captivity propagation programs of caimans.

Key words: animal protein, body weight, caiman, diet, food consumption, growth rate, total lenght.

RESUMO

Crescimento de filhotes de jacaré-do-papo-amarelo, *Caiman latirostris* (Daudin, 1802), alimentados com dietas de origem animal

Avaliou-se o crescimento de filhotes de jacaré-do-papo-amarelo (*Caiman latirostris*) submetidos a quatro dietas: (a) frango proveniente de óbito em aviário; (b) leitão proveniente da mortalidade de maternidade e creche em criações de suínos; (c) tilápia (*Tilapia rendalli* e *Oreochromis niloticus*) integral; e (d) uma mistura das fontes a, b e c. Dezesseis jacarés de sete meses de idade, com média de 208 g de massa corporal e 38 cm de comprimento total (CT), foram distribuídos nos quatro tratamentos, em lotes de quatro animais, alojados em recintos de cimento no interior de uma estufa com cobertura plástica. As dietas foram fornecidas a uma taxa de 97,8% ± 34,8% do peso vivo por semana (média e desvio-padrão; base na matéria úmida). O peso e o CT dos jacarés foram tomados a cada 30 dias durante 6 meses (nov./1995 a abril/1996). Foi efetuada uma análise de variância para medidas repetidas. As dietas proporcionaram índices de crescimento elevados, considerando o peso e o CT dos filhotes ao final do estudo: (a) 2.157 ± 743 g e 79,5 ± 6,9 cm; (b) 1.811 ± 222 g e 75,7 ± 1,9 cm; (c) 2.431 ± 780 g e 80,7 ± 5,8 cm; (d) 1.683,5 ± 736 g e 74,5 ± 7,2 cm; média e desvio-padrão. Não houve efeito significativo da dieta no peso, mas o resultado da análise esteve próximo de ser significativo

para a variável CT ($p < 0,10$). Conclui-se que todas as dietas testadas têm bom potencial, em termos de crescimento, para utilização em programas de propagação em cativeiro do jacaré-do-papo-amarelo, bem como em criação comercial em ciclo completo e *ranching*.

Palavras-chave: comprimento total, consumo alimentar, dietas, jacaré, peso corporal, proteína animal, taxa de crescimento.

INTRODUCTION

The broad-nosed caiman, *Caiman latirostris* (Daudin, 1802), is considered a specie under risk of being extinguished (Groombridge, 1987). The strategies for its preservation go from the conservation of its natural environment, and the ranching style (Larriera, 1994), to its propagation in captivity, in closed farming system, with the intention of repopulating and, commercialization of the generation F2 (Verdade & Santiago, 1991).

The looking for low cost food alternatives, under the form "humid rations" that result in good growth of the confined crocodilians, as well as dry rations, that avoid expenses of cooling, has been a priority not only on research level as well as commercial farming. Rodríguez *et al.* (1996) related that the cost of caimans feeding represents 50% to 60% of the total cost of Colombian production. However, the nutritional needs of the caimans are still not totally known. Staton *et al*. (1990a) estimated the digestible protein need for growing caimans, with living weight between 377 and 857 g as being from 42.5% to 48.7%, or the 49%-56% equivalent of crude protein (CP; average of 51.9%), using a 86.7% index for average protein digestibility (it was used a mixture of 44.6% of casein; 33.9% of blood meal, 20.9% of feather meal; 0.36% of arginine and 0.24% of DL – metionine). These authors point out the protein need can be bigger or smaller, according to the diet aminoacid composition.

The using of animal breeding production residue is one of the options on the crocodilians feeding. Joanen & McNease (1976) tested integral marine fish proceeding from drag-netting wastes (80% of the being were *Micropogon undulatus* – *Atlantic croaker*; 29.4% dry matter – DM; 27% CP; 3.8% fat), carcass of ratão-do-banhado or nutria (*Myocastor coypus*; without skin, paws and heads; 28% DM, 67.5% CP, 9.5% fat; 21% of minerals and 4,754 kcal of crude energy/kg DM; Staton *et al.*, 1990b analysis) were obtained as a by-product of commercial hunting (for fur trade – Louisiana), ration for catfish (*Ictalurus punctatus*) and turtle ration. The last two rations were not well accepted by the alligators. The comparison of the growth of the hatchlings which were given the two first diets showed that the animals fed on minced nutria carcass obtained higher growth speed (20% heavier and 3% bigger concerning total length), in relation to the animals fed on marine fish during the first year of life. Lance (1987) pointed that diets based on marine fish, rich in polienoic fat acids, are very unstable, guiding to the formation of lipid peroxides, which can cause damage to the tissues and lack of E vitamin.

Therefore, red meat, as nutria (although rodent meat is not the real red meat as cattle meat), has been, in a general way, pointed as more nutritionally adequate than the white meat, concerning the growing of the youngs or the reproductive efficiency of the alligators (Joanen & McNease, 1987).

De Vos (1982) related that a fish diet caused the growth of the crocodiles (*Crocodylus* sp.) to be faster in relation to a chicken offal, but there was no meaningful difference between fish and a mixture of fish and chicken offal.

Submitting *Crocodylus porosus* hatchlings to three protein diets during about four months, Garnett & Murray (1986) verified, by the interaction of diet and time, that the gain of weight and length of the animals treated with feral swine (*Sus scrofa*) or cattle was meaningfully superior to the crocodiles treated with salmon fillet, only in the last two months of study. However, the total of the variation explained by the diet factor was not meaningful in the analysis of the weigth and length rate increment. According to Smith & Marais (1990), few crocodile farmings in South Africa have regular access to a red meat source and, the majority of the establishments, depend on the chicken originated from the death in chicken farming to feed the animals. In his obser-

vations on the raising of crocodile hatchlings (*Crocodylus niloticus*), Pooley (1991) recommended the use of a diet of 50% of red meat and viscera, 25% of chicken carcass and 25% of fish.

Carcass and wastes of chicken production originated from non infectious mortality have been used on the proportion of 65% to 70% of the diet of adult and young *Caiman latirostris* raising by Cizbas (Comissão de Investigação em Zootecnia e Biologia de Animais Silvestres)/Esalq/USP (Piracicaba, SP), with satisfactory results on the reproduction, growth and health of animals (Verdade *et al.*, 1990). The majority of these chickens died from metabolic problems as sudden death and ascites. Studying two diets for young of *Caiman latirostris*, Piña *et al*. (1996) reported that the growth of the caimans fed on chicken head was superior to the ones treated with curimbatã (*Prochilodus lineatus*). Walker *et al*. (1993) concluded that the growth of alligators fed on swine carcass from 1 to 25 kg, coming from normal death in farming (Florida, USA), was meaningfully superior to the one of the animals fed on alligator ration during the second year of life. Ruvell (1996) announced that 80% of the alligators of a farming in Idaho (USA), hit 1.5 m in 18 months. In this farming, the animals, located in tanks filled with "thermal water", were fed on trout coming from mortality on the farming and with residues of fish filleting (trout, catfish, tilapia and sturgeon). The objective of this study was to evaluate the increasing on the weight and length of the broad-nosed caiman, using four protein diets of animal origin: chicken, piglet, tilapia and a mixture of these three.

METHODS

The experiment was conducted in the Animal Science Department, Non-Ruminants Section, together with the experimental farming of broad-nosed caiman of the Esalq/USP, Piracicaba, SP, in the period from November 1, 1995 to April 29, 1996. Three foods of animal origin (a: chicken, b: piglet and c: tilapia) and a forth treatment (d) which included a mixture of the three foods mentioned, in equal proportions based on the original material, were established to verify the answer on the caimans growth and length, when working isolated or in group. The origin and physical constitution of the three foods used to make the four treatments was: (a) poultry, mostly adult, coming from non-infectious mortality or wastes of experimental farms of Esalq, minced less: skin/feather, tip of the wing, foot, head, half of the neck, viscera and gut; the material was collected daily and stored in freezer for later collecting (about once a week) and processing; (b) piglets coming from non-infectious death (still-birth, piglets killed by the sow) or in the normal discarding of nursery/farrowing house (wasted animals), proceeding from the experimental swine farming of Esalq and from a commercial farming from the region, minced with head, skin/hair, heart, liver, lungs and kidneys; the material was collected daily, processed immediately and stored in freezer; (c) tilapias (*Tilapia rendalli* and *Oreochromis niloticus*) till 20 cm, totally minced, being caught with net (thread of 2.5 cm of side) or fished with hook in tanks of the Campus of USP, Piracicaba, according to the need of food; and (d) mixture of the previous foods (1/3 a; 1/3 b; and 1/3 c) based on the wet weight.

The chemical analysis and the aminoacid composition of the foods are shown in Tables 1 and 2, respectively. The partially dry material was determined by liofilization. Four 10 m^2 each enclosures were used, with about 70% of dry area, cement ground and masonry walls with 0.62 m of height, located into a plastic covered greenhouse. The enclosures had tanks of 0.56 m of width by 3.91 m of length and 0.46 of depth, receiving about 1 m^3 of water. In a fifth enclosure, chemical thermometers were located (–10 + 60ºC), and maximum and minimum temperature thermometers (–40 + 50ºC), both with 1ºC scale.

Sixteen hatchlings, fourteen male obtained at 32.7 ± 0.3ºC (Lang & Andrews, 1994; Pinheiro *et al*., 1997) and two female developed at 29.7 ± 0.7ºC (average and standard deviation), seven months old, coming from incubation in styrofoam boxes with controlled temperature and vermiculite as mean (Verdade, 1992) were used. At the beginning of the try groups with weight/length as homogeneous as possible among treatments were formed.

The diets were minced using a disc with 1.2 cm diameter holes on the way out, in a meat mincer. To make homogeneous the size of the particles, the foods chicken (a) and piglet (b) were passed twice by the mincer; the tilapia (c) was minced just once for its consistency was thinner after being processed.

TABLE 1

Chemical analysis of the experimental diets; mean and standard deviation (S).[a]

Diets	DM (%)	CP	Fat	MM	NFE + CF	Crude energy (CE) (cal/g)	Ca	P	Ca:P unid.	CE: CP unid.[b]
Poultry										
Mean	36.0	52.5	37.2	9.6	0.5	6,399.7	2.0	1.5	1.3	12.1
S	1.8	3.0	4.1	1.5	2.2	369.5	0.2	0.1	0.0	1.3
Piglet										
Mean	27.8	56.1	13.4	19.1	11.2	4,638.1	5.5	3.1	1.7	8.2
S	0.9	2.7	3.8	2.9	3.2	362.5	0.7	0.4	0.0	0.9
Tilapia										
Mean	30.0	47.0	32.6	17.3	2.9	5,636.7	5.1	2.6	1.9	11.9
S	0.3	0.5	0.4	2.1	2.6	212.5	0.8	0.2	0.1	0.5
Mixture										
Mean	29.4	54.6	26.0	16.4	2.8	5,470.7	5.0	2.7	1.8	10.0
S	1.6	0.9	4.6	4.8	0.3	363.5	1.4	0.6	0.4	0.5

[a]Analysis performed in the Cena (Centro de Energia Nuclear na Agricultura), USP laboratory, Piracicaba, SP; CP, Fat, Mineral Matter (MM), Ca, P e Free Nitrogen Extract (FNE) + Crude Fiber (CF) in % of dry matter (DM). It was added to wet diet 0.1% of mineral mixture containing (by kg of premix): 240 g of Mn, 200 g of Zn, 120 g of Fe e 20 g of Cu.

[b]Crude energy (CE; cal/g DM); crude protein (CP) relation.

TABLE 2

Aminoacid composition of the experimental diets.[a]

	% in the dry matter			
Aminoacid	**Poultry**	**Piglet**	**Tilapia**	**Mixture**
Methionine	1.44	1.57	1.51	1.63
Cystine	0.65	1.06	0.61	0.81
Lysine	3.78	2.88	3.15	3.62
Tryptophane	0.54	0.46	0.38	0.51
Treonina	2.23	2.21	2.09	2.41
Isoleucine	2.15	1.85	1.87	2.16
Histidine	1.38	1.20	0.90	1.32
Valine	2.31	2.70	2.24	2.61
Leucine	3.81	4.01	3.28	4.07
Arginine	3.51	4.11	3.20	3.66
Phenylanine	2.28	2.47	1.90	2.44
Tyrosine	1.35	1.23	1.15	1.25
Glycine	3.56	6.86	4.87	5.10

[a] Analysis performed in the Mogiana Alimentos Ltda. (Campinas, SP) laboratory.

For the preparation of the mixture (d), the monodiets suffered an initial mincing separately and after a manual mixture, a second mincing. The foods were stored in freezer and put for defrosting in the fridge or straight at room temperature, on the feeding day.

The feeding was done between 15:00 and 19:00 hours and it varied from 18 to 29 meals per

The feeding was done between 15:00 and 19:00 hours and it varied from 18 to 29 meals per month, avoiding fast on hotter days, it did not matter what day of the week. To proportionate food *ad libitum*, the supply was iniciated at rate of approximately 75% of the animals initial living weight (per week; a three times higher rate than the one pointed by Joanen & McNease, 1976) and in a four times frequency per week, based on the original material (wet). Afterwards, the supplying was monthly adjusted, according to the variation of food excess on the platforms, which was measured in the morning following the feeding. It was addicted 1% of vitamin premix according to the formula recommended by Joanen & McNease (1987) and, 0.1% of mineral premix (without Ca and I; formula adapted from Staton *et al*., 1990a), both based on the wet weight of the diets. The cleaning of the rooms was made according to the water situation and varied from one to three times per month. A completely randomized design with four treatments and four caimans per tank, being each animal considered a repetition, was used. With the intention of avoiding enclosure effects, the treatments were drawn randomly in the enclosures. The weight and the length of the animals were measured monthly during six months (Nov./1995 to Apr./1996). An analysis of variance for repeated measures (split plot on time) was made. The initial weight and total length measures were used as covariable and, the test of the "DMS" (Minimum Significant Difference) at a meaningful level of 5%, was used to make comparison between the averages. The statistical analyses were made on "SAS" statistical analysis system.

RESULTS AND DISCUSSION

The dry matter apparent average consumption is shown on Table 3. The data show that the DM consumption in body weight percents per week was bigger with tilapia. The Table 3 shows an initial tendency of increasing and later fall in apparent consumption rate in living weight percent per week. The temperature fall at the end of the experimental period may explain that fact, as the water temperature hit a maximum of 37ºC in January, but after March, it did not trespass 30ºC.

The wet food monthly average supply rate was 97.8% ± 34.8% of average living weight per week (average and standard deviation). The apparent average consumption of wet material resulted in 75.5% ± 27.7% of the average living weight per week between December/1995 and April/1996.

TABLE 3

Monthly mean dry matter apparent consumption calculated in percentage of mean body weight by seek for caimans (*Caiman latirostris*) feed with four animal protein diets.[a]

	Dry matter apparent consumption (% of mean body weight by seek)						
Diet	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**	**Mean[b]**	**S**
Poultry	30.67	27.20	24.45	12.68	11.44	21.28	8.7
Piglet	26.61	34.20	29.91	14.58	9.78	23.01	10.3
Tilapia	31.87	32.65	38.61	23.78	21.92	29.76	6.8
Mixture	26.01	27.38	19.36	12.82	4.78	18.07	9.4
Mean	28.79	30.35	28.08	15.96	11.98	23.03	

[a] Monthly mean weight was stablished as mean between one weighing and the next; it consider that each month had 3.4 weeks to calculation effect.

[b] Mean of the lines excluding November month; S = standard deviation.

The apparent consumption value, before mentioned, tends to super estimate the real consumption because of the non weighted rests spread on the water (the caimans take the feed for the water to eat, when they lose part of the food, once it is minced), being a better estimate of a

consumption intention and, therefore, of average food percent to be offered to hit consumption *ad libitum*. Joanen & McNease (1987) pointed that the best rate of wet food supply for alligators, in a way of avoiding excess of rests and, at the same time, allow satisfactory growth, was of 20% of the living weight per week during the first year of live. The surprising major rate of supply verified at the present trial, about three times bigger than the quoted for alligators, could be explained by the minor competition for food resulting from the smaller population density used and, also, by the major frequency of food supply in comparison to the alligators kept in experimental farming, the ones that were fed from three to five times per week.

Although the analysis of joint variation has not indicated significative differences ($p > 0.26$) for absolute weight values, the result approached significance for total length variable ($p > 0.10$). The difference on the TL (total length) was meaningful ($p < 0.05$) at the age of four months, only for the comparison to the tilapia treatment, whose animals obtained higher performance, towards the caimans fed on piglet or mixture, among which there was no difference. The Table 4 shows that a higher growth average rate in absolute value was obtained with tilapia. Hence, the results of Joanen & McNease (1976) and Garnett & Murray (1986), that verified higher growth on the crocodiles fed with red meat animal carcass in comparison to the ones treated with white meat (marine fish), differ from the ones found on the present experiment concerning the answer on the growth as a result of the meat type. The data of the present assay indicate that the tendency of the higher growth obtained with white meat was mainly due to the higher consumption of food for the tilapia diet (Table 3) and not to differences on the essential aminoacid percents in dry matter on the diets that seem to be similar among the protein sources (Table 2). However, the lowest protein level of the tilapia (47%; below the 51.9% indicated by Staton *et al*., 1990a) suggests the existence of a higher proportion of essential aminoacids in its protein. The highest consumption of tilapia could be explained by the feeding preference. Mopurgo *et al*. (1990) indicated that the Nile Crocodile prefer fish (*Cy-prinidae*) to living one-day-old chicken or meat (non specified), however, Garnett & Murray (1986) did not find meaningful variation in the accepting of three diets offered to *Crocodylus porosus* (pork meat = 90%; cattle meat = 83%; and salmon fillet = 77%).

The total average weights and lengths of the 16 caimans at the end of the present experiment, when they were thirteen months old, they were 1,907 ± 760 g and 75.5 ± 9.06 cm respectively. The values of final weight (244 g) and total length (41.3 cm) at the thirteen months, reported by Larriera (1990) for a group of 17 caimans (*Caiman latirostris*) raising in Província de Santa Fé (Argentina) with meat and fish, were inferior to the ones found in the trial, probably due to the low winter temperatures faced in that place. Larriera (1994) found final values in weight at the twelve month of 275 g for caimans fed on minced chicken head + wheat bran and vitamin-mineral mixture. Yanosky & Mercolli (1995), working with this same specie,

TABLE 4

Mean monthly total lenght (TL) gain {mean (x)/standard deviation (S)} of the caiman (*Caiman latirostris*) hatchlings submitted to differents diets of animal origin.

	Diet			
Variable/month	**Poultry (x/S)**	**Piglet (x/S)**	**Tilapia (x/S)**	**Mixture (x/S)**
Initial TL (cm) :	39.9/4.4	39.1/4.5	39.1/4.4	40.0/5.7
TL gain (cm):				
November	6.0/1.5	5.5/0.8	6.2/1.5	5.6/0.6
December	7.4/0.7	5.9/0.9	8.5/1.2	6.5/1.2
January	7.6/1.0	7.1/0.7	9.5/0.9	8.3/1.9
February	7.6/0.2	7.8/1.2	8.2/0.6	7.0/2.3
March	5.8/0.2	7.3/0.9	5.2/0.2	6.0/0.4
April	5.0/1.3	2.8/1.5	3.7/0.6	0.9/1.3
Mean:	6.5/1.1	6.0/1.8	6.8/2.2	5.7/2.5

reported final weights at 400 g and final total length of 45 cm at the age of one year old.

Compared to the total final weight and length hit (1,195.7 g and 64 cm, respectively, at the age of twelve months) by Pantanal caiman (*Caiman crocodilus yacare*) in confined system (Marques & Monteiro, 1995), the results of the present experiment were also superior.

The apparent food conversion (FC) was calculated for the period between Dec./1995 and Apr./1996 and the monthly variation was from 1.66 to 5.26 kg DM/kg in gain of living weight (LW). The poultry was one the foods with better utilization (average FC of 2.54). This food showed higher consistence, lower losses by draining and probably low loss at the time of food catch, due to its dry material content, crude energy and fat a bit higher (Table 1). In the context of the vary organisms in animal kingdom, fish (Page & Andrews, 1973) and aves (Scott *et al*., 1969) answered to the excess of energy in the food by reducing the consumption and, the caimans fed on chicken diet, certainly did not skip this rule.

The caimans fed on piglet and tilapia exhibited the worst apparent food conversion rate (3.21 and 3.61, respectively). The (b) diet (piglet) seemed to present the higher losses by draining probably due to its higher liquid content (Table 1). The chemical analysis also pointed that the free nitrogen extract (FNE) + crude fiber compose a higher fraction of the piglet (Table 1), being probably a limitation factor for the best utilization of this food, once the swine hair was found in the feces of the caimans.

The worst general average of food conversion, verified with the tilapia diet, can be connected to a higher water waste (not measured) between the catch and ingestion of this food, what made the consumption and conversion estimate further from the truth. The tilapia presented smaller consistence and, therefore, dissolved more in the water, happening faster algae growth and higher dirtiness in the tank. Another explanation, connected to the previous, is that, as the animal of this treatment grew at a little bigger rate, the waste increased more, proportionally, making worse the conversion as time went by. A higher consume frequency by these animals corresponds to a higher number of bites, with higher losses in relation to other treatments. Besides that, bigger animals and in a higher movement frequency on the feed platform, on the food, may have enlarged the loss. Staton *et al*. (1990c), using six-month-old alligators with 622 g of initial body mass obtained FC values between 1.2 and 7.2 kg MS/kg LW during eight weeks of trial with four granulated rations (with the addition of water) or mixed with nutria. These authors emphasized that the food consumption and the food conversion didn't reflect truth values due to ocurrence of non measured rests. Garnett & Murray (1986) also observed worst food conversion and more food consumption in percentage of the living weight (but not in absolute values) for crocodiles fed on fish, in comparison to the ones treated with swine or cattle meat, but no explanation to the fact was found. Joanen & McNease (1987) calculated that the food conversion of alligators treated with marine fish/nutria was of 1.42:1 even until three months old and approximately 2:1 until twelve months old.

The growth rates verified during the experimental period were superior the ones found for caimans of the same gender in natural conditions during the first year of live (2 to 2.6 cm/month; *Caiman crocodilus* – Venezuela). The fast growth of animal after the pre-experimental period suggests the happening of compensatory growth in crocodilians, which is a common phenomenon in fish.

The low stocking rate used in the present study associated to the very good growth obtained, indicates that the storage density caimans in raising is one of the main factors in the food consumption determination and, therefore, of the growth, suggesting the realization of experiments to follow the behavior of these variants concerning the stocking rate. Although the tested diets have presented important differences on their crude protein, energy, fat, calcium and phosphor levels, the possible influences of these components on the caiman growth were confusing due to the consumption variation among diets (there would be the need of making experiments with isocaloric diets). The animals fed on tilapia had the tendency of presenting a higher consumption, possibly due to a better palatability, and so demonstrated higher growth speed in absolute value. It seemed not be differences on the essential aminoacid percents in the dry matter of the diets that justify this better growth rate for the tilapia diet.

Although the caimans, specially the ones fed on chicken and piglet, have presented a good performance it is recommended the use of an antimicrobian agent as the Zinc Bacitracin (Marques & Monteiro, 1995) or Olaquindox (Rodríguez *et al*., 1996), to be addicted to the vitamin mixture on the

attempt of obtaining an extra development on the growth, concerning the animal material used can remain for hours after the death, in the farming, taking into consideration the undesirable microorganisms which consume nutritional substances in the digestive trait of the caiman. For a better feeling of material the use of dead piglets has to be associated to farms with about 500 breeding females. In case of feed with chicken the caiman raising has to be integrated to poultry farms with of about three aviary. Concerning the use of tilapia, it is necessary to feed the fish during the capture and observe that the fish production may reduce during the colder months. The food combination is recommended too.

CONCLUSION

The tested protein animal sources, poultry, piglet, tilapia and the mixture of the three foods, were able to proportionate to the hatchlings relatively high weight and length gain and, they did not show difference among them, demonstrating to have potential, in growth sense, to be used in commercial farming and caiman propagation programs. In similar conditions to this experiment, it is indicated that the supply rate to hit the voluntary consumption of wet material by the caimans (including food rests) must be of 75% ± 27% of living weight per week, corresponding to 23% per week, on the dry matter. This rate must be adjusted taking into consideration the water temperature. During the hot season the food supply must be daily to maximize the growth. The results showed that the white meat sources (fish) can be as adequate as the red ones concerning the growth of the caimans.

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