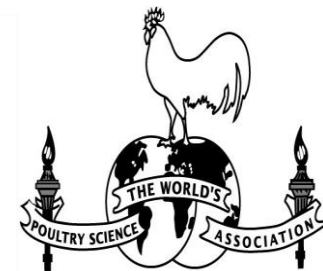


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education organization research

THEME: *Emerging Challenges facing Animal Agriculture in Nigeria and the Way Forward*

EFFECTS OF FERTILIZATION AND BOILING DURATION ON NUTRITIONAL COMPOSITIONS AND ORGANOLEPTIC PROPERTIES OF SHIKA-BROWN EGGS

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Introduction

- Avian eggs
 - Formation (ISA, 2015)
 - Anatomy (ISA, 2015)
 - Biological value: (IsoNova, 2016; Hoffman and Falvo, 2004). However, Wikipedia (2016a; b; Eggcyclopedia, 2016b)
 - Allergic reactions : Cantani (2008); Eggcyclopedia, 2016a
 - Fertilization (ISA, 2015)



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Justification

- Little or no information on influence of egg fertility on egg nutritional quality
- Hard boiling may denature the essential nutrients in avian eggs

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Objectives

- To evaluate the effects of egg fertility and boiling duration on organoleptic properties
- To determine the effects of egg fertility and boiling duration on nutritional profiles

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Materials and Methods

- Source of eggs:
 - Ahmadu Bello University, Zaria
 - Avian species: Shika-brown at 29 months
- Total of 100 eggs (1 fertilized : 1 unfertilized)
- Nutrients determinations:
 - 24 boiled eggs at different time interval (AOAC, 2000)
- Organoleptic evaluation
 - 76 eggs were offered to semi-trained taste panelists
 - 9-point Hedonic scales (Wichchukit and O'Mahony, 2014).

Data collection and analysis

❖ Data collected

➤ Organoleptic parameters:

- Appearance
- Taste
- Colour
- Aroma
- Mouth feel
- After taste
- Overall acceptability

➤ Nutritional profiles:

- Proximate
- Lipoproteins

➤ Mineral constituents

- Macro
- Trace

❖ Data analysis

- Data collected were analyzed according to GenStat (2008)

Results and Discussion

Table 1: Organoleptic evaluation of fertilized and unfertilized Shika-brown eggs boiled at varying duration.

Parameters	Main Treatments	Sub-treatments: boiling duration (Minutes)						Statistics		
		10	20	30	40	50	60	Mean	LSD	Prob.
Appearance	Fertilized	6.90	6.85	7.50	7.20	7.85	7.65	7.33	1.91	0.028
	unfertilized	7.70	7.10	7.05	7.15	6.80	7.00			
Taste	Fertilized	6.35	6.75	7.25	7.00	7.50	7.60	7.10	1.76	0.001
	unfertilized	7.65	7.35	6.80	7.45	6.45	6.90			
Colour	Fertilized	6.50	6.35	7.40	6.95	7.30	7.10	6.95	1.92	0.034
	unfertilized	7.10	6.90	6.50	7.45	6.45	6.85			
Aroma	Fertilized	6.70	6.80	7.25	7.20	7.15	7.15	7.04	1.59	0.306
	unfertilized	6.95	6.80	6.80	7.30	6.70	6.70			
Mouth feel	Fertilized	6.80	6.65	7.50	7.10	7.25	7.30	7.11	1.71	0.344
	unfertilized	7.30	6.65	6.70	7.20	7.05	6.90			
After Taste	Fertilized	6.40	6.30	6.65	6.85	6.65	7.45	6.70	1.87	0.123
	unfertilized	6.90	6.80	6.30	6.75	6.90	6.50			
Overall acceptability	Fertilized	6.95	6.35	7.40	6.95	7.30	7.10	7.36	1.91	0.030
	unfertilized	7.25	6.90	6.50	7.45	6.45	6.85			

Hedonic scale used: 9 = like extremely, 8 = like very much, 7 = like moderately, 6 = like slightly, 5 = neither like nor dislike, 4 = dislike slightly, 3 = dislike moderately, 2 = dislike very much and 1 = dislike extremely.

Table 2: Nutritional compositions of fertilized and unfertilized Shika-brown eggs boiled at varying duration.

Nutrients	Main Treatments	Sub-treatments: boiling duration (Minutes)						Statistics		
		10	20	30	40	50	60	Mean	LSD	Prob.
Egg weight (g)	Fertilized	59.00	56.00	49.00	52.00	60.00	53.00			
	Unfertilized	53.00	45.00	58.00	57.00	48.00	58.00	54.00	0.000	0.000
Crude protein (%)	Fertilized	14.44	14.06	12.93	13.23	16.38	13.54			
	Unfertilized	13.43	12.26	15.05	14.31	12.53	15.83	13.99	0.073	0.001
Crude Fat (%)	Fertilized	11.77	11.39	11.13	11.38	12.68	11.25			
	Unfertilized	11.55	10.27	12.12	11.87	10.54	12.46	11.53	0.004	0.010
Ash (%)	Fertilized	1.39	1.47	1.45	1.52	1.56	1.59			
	Unfertilized	1.54	1.43	1.34	1.50	1.36	1.30	1.50	0.007	0.010
Moisture content (%)	Fertilized	56.88	55.11	55.65	54.56	55.45	56.13			
	Unfertilized	54.88	56.31	55.39	56.59	54.77	54.37	55.51	0.002	0.001
Carbohydrates (%)	Fertilized	15.53	18.03	18.83	19.33	14.02	17.53			
	Unfertilized	15.62	19.80	16.12	15.74	20.82	10.05	17.53	0.004	0.010
Gross Energy (Kcal/ 100g)	Fertilized	1.72	1.74	1.78	1.74	1.66	1.74			
	Unfertilized	1.76	1.77	1.71	1.68	1.79	1.69	1.73	0.001	0.010
Total Cholesterol (mg)	Fertilized	765.80	749.75	742.60	753.60	795.30	785.70			
	Unfertilized	751.45	769.40	791.50	778.80	736.25	789.50	767.47	0.003	0.001
HDL (mg)	Fertilized	225.70	218.80	213.60	226.00	251.45	236.65			
	Unfertilized	224.75	227.80	243.80	226.65	211.50	234.25	228.13	0.014	0.001
LDL (mg)	Fertilized	348.80	337.60	332.95	339.35	376.05	358.35			
	Unfertilized	338.75	341.50	341.50	339.75	329.65	356.45	347.23	0.021	0.001
Triglycerides (mg)	Fertilized	191.30	195.85	196.05	188.25	167.80	190.70			
	Unfertilized	188.45	200.10	180.15	212.40	195.10	198.80	192.08	0.283	0.001

LSD: Least significant difference; *Prob.*: Probability; *HDL*: High density lipoprotein; *LDL*: Low density lipoprotein

Table 3: Mineral constituents of fertilized and unfertilized Shika-brown eggs boiled at varying duration.

Parameters (mg/100 g)	Main Treatments	Sub-treatments: boiling duration (Minutes)						Statistics		
		10	20	30	40	50	60	Mean	LSD	Prob.
Calcium	Fertilized	107.00	110.00	124.00	105.00	111.00	130.00	116.71	0.652	0.001
	Unfertilized	112.50	122.50	127.00	120.00	116.00	115.00			
Phosphorus	Fertilized	197.90	196.25	207.57	193.36	194.70	224.80	202.43	0.424	0.980
	Unfertilized	198.24	198.17	211.36	205.19	201.70	199.85			
Iron	Fertilized	1.86	1.60	2.37	1.81	2.03	2.91	2.08	0.024	0.397
	Unfertilized	1.76	2.23	2.65	2.05	1.93	1.80			
Magnesium	Fertilized	11.26	11.40	11.97	11.18	11.43	12.15	11.66	0.021	0.001
	Unfertilized	11.46	11.94	12.07	11.90	11.64	11.57			
Potassium	Fertilized	132.70	137.30	148.40	129.95	139.25	155.50	142.11	0.450	0.001
	Unfertilized	140.00	140.60	153.35	145.55	141.60	141.15			
Sodium	Fertilized	79.05	80.25	87.00	84.95	81.05	92.60	84.24	0.253	0.618
	Unfertilized	81.35	85.45	88.45	85.55	82.80	82.40			
Zinc	Fertilized	3.50	3.00	2.800	4.35	5.20	3.80	4.14	0.024	0.001
	Unfertilized	3.50	5.65	5.050	5.50	2.50	5.00			
Copper	Fertilized	0.58	0.44	0.41	0.47	0.83	0.35	0.57	0.005	0.001
	Unfertilized	0.56	0.86	0.53	0.81	0.83	0.70			
Selenium	Fertilized	0.04	0.03	0.03	0.05	0.06	0.04	0.05	0.001	0.001
	Unfertilized	0.04	0.06	0.05	0.06	0.03	0.05			
Manganese	Fertilized	0.15	0.10	0.07	0.23	0.25	0.27	0.19	0.001	0.001
	Unfertilized	0.21	0.19	0.21	0.28	0.13	0.16			

LSD: Least significant difference; Prob.: Probability.

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Thanks for your attention!



...please take an egg daily whether fertilized or not