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FACULTY OF ANIMAL PRODUCTION
M.Sc. In Poultry Production

Evaluation of the Imported Pre-starter
Diets on Broiler Performance and
Carcass by Products

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Introduction

pre-starter diet is primary a level feed for the broiler breed of chicken which is most widely used for cooking and eating purposes . These pre-starter feeds as stated by Mayur, the team leader of Hindustan Animal feeds (2014) since there use in India (1996-2014) provided a boost up in the health and growth to the chickens and also provide them proper immunity against several kinds of diseases and infections. He also claimed that poultry pre starter feed is suitable in feeding during first eight days of broiler poultry chicks .

Raghavan (2010) reported that there were two types of pre starters .The first one comes in the form of paste .This is usually supply in limited amount in the boxes during transportation from the hatchery to the poultry houses . It aims mainly to keep birds hydrated , but it also offers a good of energy and electrolytes . The second type of pre starter is more likely the usual dry feed ,but in the form of meal (usually but not always) instead of pellets . It is fortified diet supplying extra energy ,minerals ,vitamins , and most importantly certain additives for enhanced gastrointestinal health.

The finding of Ali Ahmed(2010) indicated that pre starter in Pakistan is giving excellent results of up to 0.80 FCR for first 7 days of broiler life . The broilers must be given such nutrition during first 10-12 days and it will be impact for whole of broiler life .

The objectives of the present study are:

- 1- To evaluate the general effect of the imported pre starter diets on broiler performance and carcass characteristics .
- 2- To determine the best formula that matches the early broiler chick nutrient requirement under the Sudan conditions.

Material and Methods

The experiment was conducted at Shambat area , university of Khartoum , during summer season(27thMay 10th July 2014) where weekly average maximum and minimum temperatures , and Relative Humidity at Shambat area were recorded in respective to be 46 °C and 32 °C and 44% and 22%. To evaluate the general effect of the imported pre starter diets on broiler performance and to determine the best formula that matches the early chick nutrient requirement, four pre-starter diets(WAFI,

KOUDIJS , GROBEL and NUTRISTAR) in addition to ingredients of the control diet were purchased from the local market. The formula of the control diet was shown in Table(1) whereas Table (2) reflected the chemical composition of the control and pre-starters diets . While the chemical composition of the control diet was determined in the nutritional lab of the faculty of animal production, the chemical composition of the pre-starter diets were obtained from the labels of producing companies. The control diet(mash) and the four pre-starter diets(pellets) constitute the five dietary treatments of this study. The dietary treatments effects on performance , carcass and non carcass parameters of the experimental birds were assessed on either weekly or overall age basis .

Preparation of the Experimental House:

The experiment was carried out on floor house which was covered by a sawdust bedding of 1 inch thickness. The Northern side of the experimental house was covered with plastic sacks to prevent conventional heat effects and to control the direct sun rays . The house was subdivided by wire netting into 15 pens of one(m²) each. Each pen floor contained one feeder and one drinker . A 60 watt bulb per two pens were used for artificial lighting through evening time. The house and equipment were cleaned and disinfected using phenol .The prepared house was closed pending the arrival of the experimental birds.

Purchasing and Distribution of the Experimental Birds:

One hundred and fifty day-old broiler chicks (Hubbard classic) were purchased from a local commercial company of poultry production and transferred to the prepared experimental poultry house at faculty of animal production .At arrival, the chicks were initially weighed and divided into five even groups .Each group was then subdivided into three replicates of ten chicks each. Each replicate group of chicks were confined into one of the prepared 15 experimental pens and randomly assigned to one of the five dietary treatments .

Management Procedures and Data Collection:

The pre-starter diets were provided only during the first week experimentation period. For the rest of the experimental period which lasted for 6 weeks, all the five experimental groups of chicks were fed the control diet.

Daily throughout the experimentation period, the house entrance was cleaned early in the morning using phenol. Similarly , drinkers and feeders were cleaned and filled with water or a weighed amount of feed . Light was provided for 24 hours a day by supplementation of the natural daylight with artificial lighting at nights.

The recorded data included the amount of feed provided and the mortality rate on daily basis in addition to weekly feed intake and body weight gain which were used for estimation of feed conversion ratio records. The feed intake was calculated by difference i.e. the amount offered minus the remaining. The experimental birds were vaccinated against infectious bronchitis and Newcastle disease on 3rd, 13th and 21th days, through drinking water. Soluble multi vitamins compounds (VMD-oligo vit plus 100 gm/200-400 liter of drinking water and antibiotic Eriprim concentrado (erythromycin (TCN) 200mg plus colistin sulphate 300,00 I.U + Excipient 1gm) Spain. Dose 0.25 - 0.5g/liter of drinking water, were given after each vaccination to guard against stress.

In early morning of the day 43 , the termination of the experiment , feeders were removed and all birds were leg banded and individually weighed for determination of the final live body weight . Then the birds of each replicate group were slaughtered manually , bled and scalded using boiling water whereas the feathers were removed by handpicking . Post bleeding and defeathering processes, measurements of blood and feather weights were achieved . Then the heads , feet and oil glands were removed and the evisceration process was done.

Likewise, the crops, trachea and esophagus were completely removed. Next, the giblets (livers, hearts & gizzards) ; offal (the rest of the gastrointestinal tract, feet, heads, kidneys & lungs) ; hot and cold carcasses ; abdominal fat ; in addition to dressing out percentages, hot carcass weight and the intestinal lengths and weights of each replicate group of birds were determined . Finally, the carcasses were chilled for twenty four hours and hence their cold weights were determined.

Statistical Analysis:

The Experiment was conducted employing Complete Randomized Design (CRD). The generated data were analyzed using factorial arrangement 5x6 (diets and age). In case of significant differences among treatment ($P < 0.05$), means were compared using Duncan's Multiple Range Test (Duncan, 1955).

**Table(1) : The formula of the control
experimental diet(Tc):**

Ingredients	%
Sorghum	64.62
Groundnut	28.50
Broiler concentrate	5.00
Limestone	0.80
Nacl	0.20
Methionine	0.08
Vegetable oil	0.50
Premix	0.20
Anti toxic	0.10
Total	100

Table(2): The determined chemical composition of the control and pre-starter diets(%)

Constituents	Dietary treatments				
	T _c	T _w	T _k	T _g	T _n
Crude protein	21.36	21.36	22.00	22.50	22.0
Crude fat	5.60	5.60	7.00	6.50	6.70
Crude fiber	4.47	4.47	3.00	3.50	2.80
Crude ash	5.82	5.82	0.00	5.50	0.00
Calcium	0.00	0.00	0.00	0.85	0.85
Total phosphorus	0.61	0.61	0.85	0.60	0.60
Methionine	0.46	0.46	0.55	0.58	0.60
Methionine + cystine	0.00	0.00	0.95	0.92	1.00
Lysine	0.00	0.00	1.30	1.35	1.25
Sodium	0.20	0.20	0.19	0.12	0.15
ME(kcal/kg)	2810	2810	3200	3080	2840

T_c = Control diet.

T_w = WAFI pre-starter.

T_k = KOUDIJS pre-starter.

T_g = GROBEL pre-starter.

T_n = NUTRISTAR pre-starter.



RESULTS AND DISCUSSION

Table (3) The effect of pre-starter dietary treatments on weekly feed intake of broiler chicks (gm/bird):

Age	Dietary treatments					SEM
	T _c	T _w	T _k	T _g	T _n	
1 st week	152.33 ^{ab}	159.00 ^{ab}	140.33 ^{ab}	138.17 ^a	163.50 ^b	6.46
2 nd week	247.00 ^a	315.33 ^b	295.50 ^{ab}	304.50 ^{ab}	285.50 ^{ab}	15.14
3 rd week	283.17 ^a	387.00 ^{ab}	371.83 ^{ab}	412.83 ^b	362.33 ^{ab}	28.15
4 th week	494.85	626.90	597.83	596.50	538.33	30.77
5 th week	608.44 ^a	692.17 ^{ab}	739.54 ^b	726.17 ^b	675.67 ^{ab}	29.74
6 th week	699.21 ^{ab}	766.17 ^b	687.33 ^{ab}	634.50 ^a	722.17 ^{ab}	27.84

a, b values with a row bearing different super scripts differ significantly ($p < 0.05$)

T_c = Control diet

T_w = WAFI pre-starter

T_k = KOUDIJS pre-starter

T_g = GROBEL pre-starter

T_n = NUTRISTAR pre-starter

SEM = standard error of the mean of degree of freedom 20

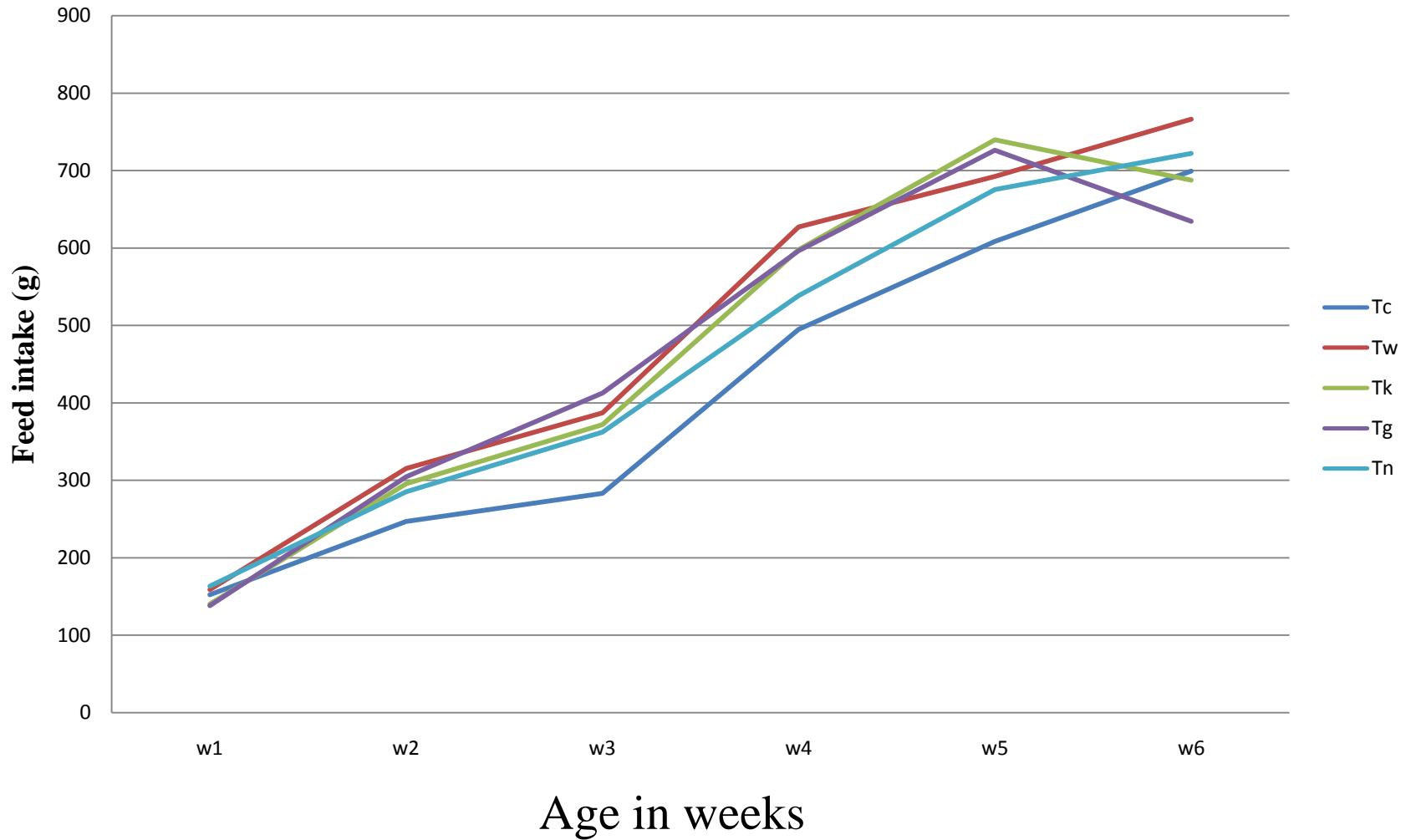


Figure (1) weekly feed intake of broiler chicks

Table (4) The effect of pre-starter dietary treatments on weekly body weight gain of broiler chicks (gm/bird):

Age	Dietary treatments					SEM
	T _c	T _w	T _k	T _g	T _n	
1 st week	63.17 ^a	143.87 ^c	132.67 ^{bc}	116.83 ^b	125.00 ^{bc}	18.09
2 nd week	93.00 ^a	177.83 ^{bc}	170.83 ^{bc}	196.67 ^c	143.50 ^b	23.23
3 rd week	161.83	208.67	194.50	256.33	200.50	19.66
4 th week	222.02 ^a	324.50 ^b	314.33 ^b	290.50 ^{ab}	316.17 ^b	24.20
5 th week	286.00	313.00	360.74	394.83	340.00	24.28
6 th week	320.46	334.17	243.86	229.83	278.83	26.43

a, b values with a row bearing different super scripts differ significantly
($p < 0.05$)

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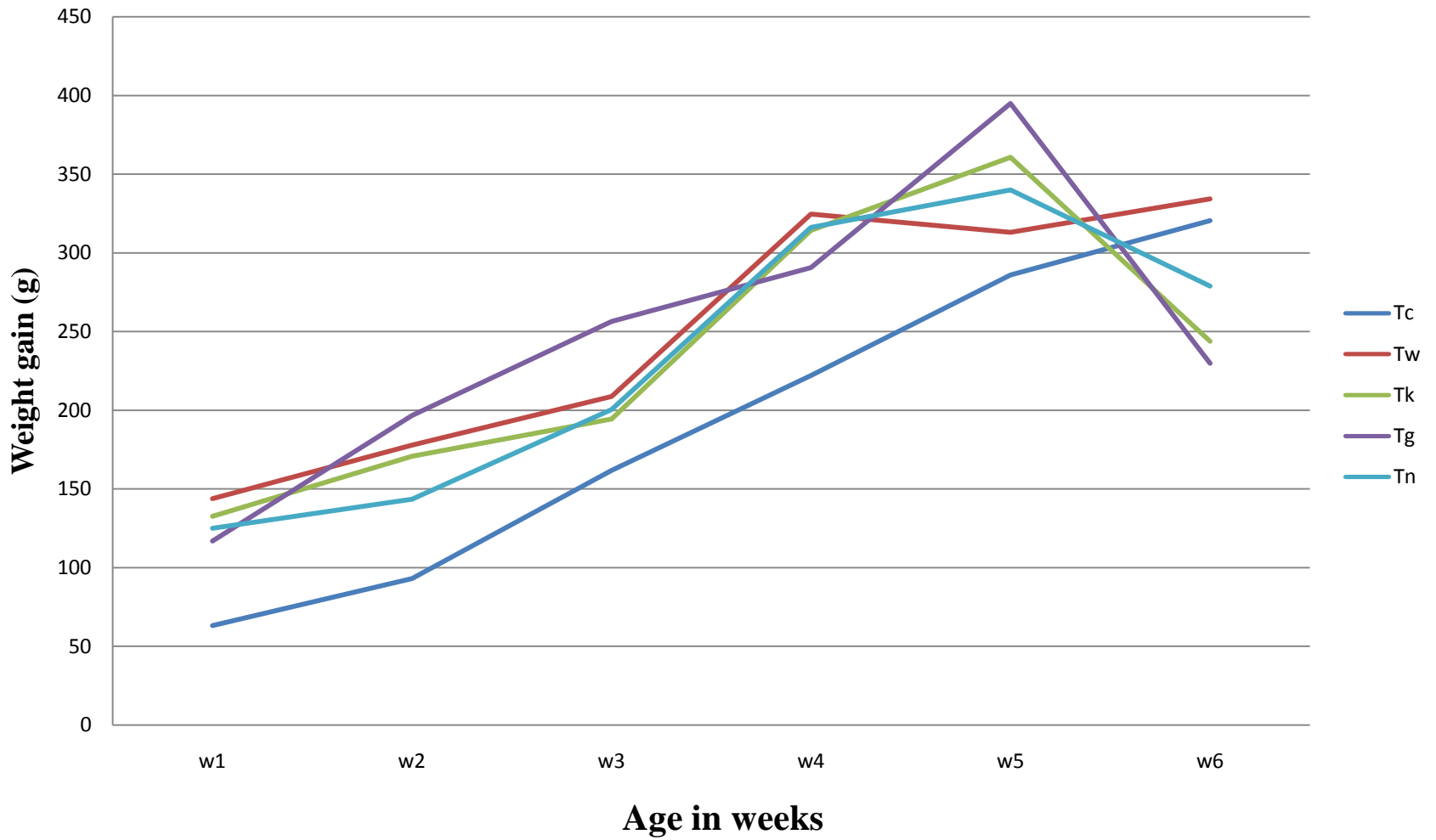


Figure (2) weekly weight gain of broiler chicks

Table (5) The effects of dietary pre-starter treatments on weekly feed conversion ratio of broiler chicks (gm/bird):

Age	Dietary treatments					SEM
	T _c	T _w	T _k	T _g	T _n	
1 st week	2.41 ^c	1.10 ^a	1.06 ^a	1.20 ^{ab}	1.31 ^b	0.33
2 nd week	2.65 ^b	1.79 ^a	1.76 ^a	1.56 ^a	2.02 ^a	0.24
3 rd week	1.79	1.88	2.02	1.62	1.81	0.08
4 th week	2.23	1.93	2.03	2.10	1.70	0.11
5 th week	2.14	2.21	2.18	1.87	1.99	0.08
6 th week	2.21	2.29	3.17	2.78	2.96	0.24

a, b values with a row bearing different super scripts

differ significantly ($p < 0.05$)

T_c = Control diet

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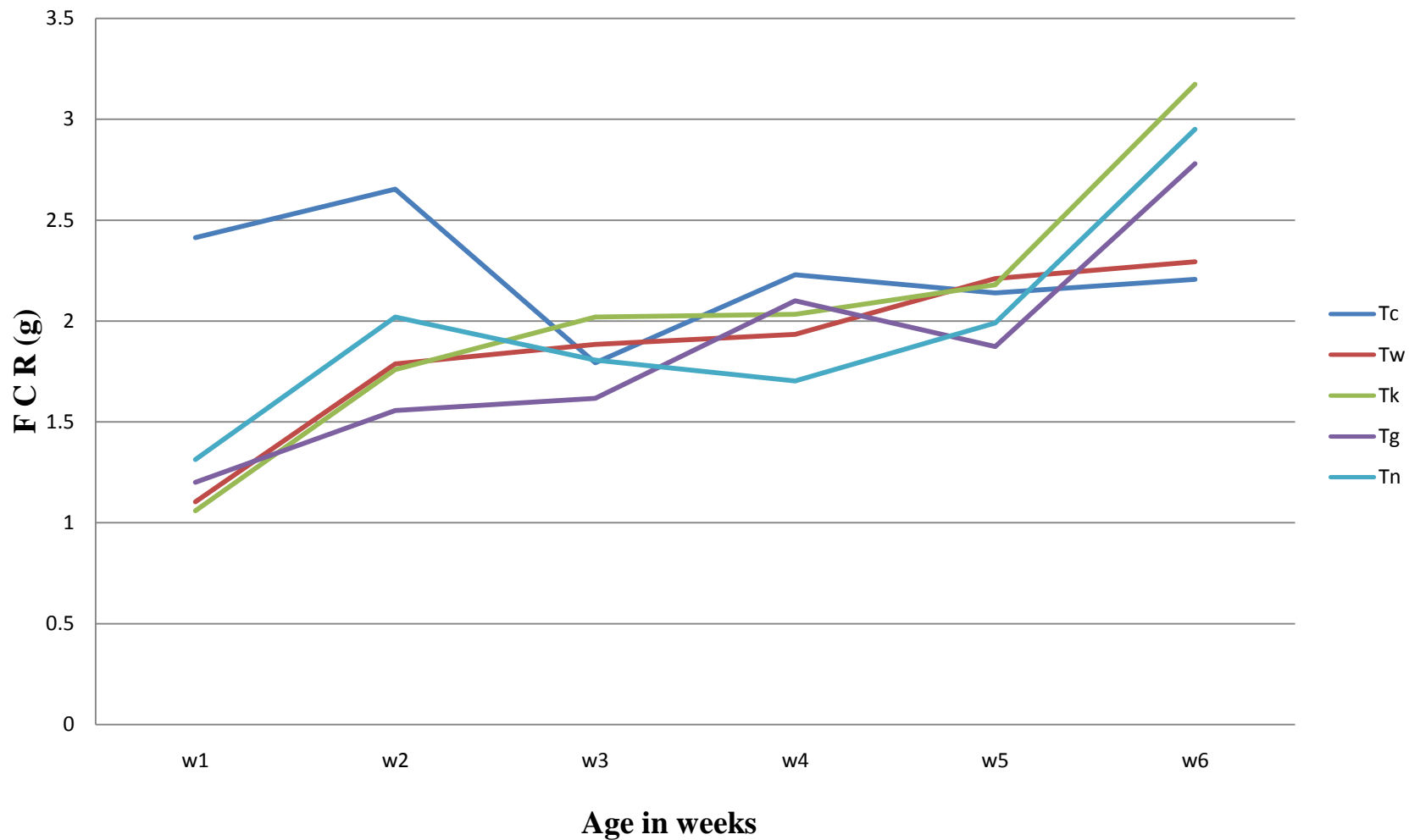


Figure (3) weekly feed conversion ratio of broiler chicks

Table (6) The effect of dietary pre-starter treatments on overall performance of six weeks age broiler chicks:

Parameters	Dietary treatments					SEM
	T _c	T _w	T _k	T _g	T _n	
Final B. Wt _(gm/b)	1339.4	1547.5	1494.5	1446.8	1450.3	83.53
Total F. intake _(gm/b)	2485.0 ^a	2946.6 ^b	2903.2 ^b	2812.7 ^{ab}	2747.5 ^{ab}	110.47
Total B. Wt G _(gm/b)	1146.5 ^a	1502.0 ^b	1416.9 ^b	1485.0 ^b	1404.0 ^b	68.7
F CR _(gm/b)	2.18 ^b	1.96 ^{ab}	2.05 ^{ab}	1.90 ^a	1.96 ^{ab}	0.06
Dressing out%	63.80	74.24	74.91	70.29	70.64	3.73
Mortality rate	0.11	0.00	0.06	0.00	0.00	0.05
Hot carcass Wt _(gm)	845.6 ^a	1155.6 ^b	1120.6 ^b	1018.9 ^{ab}	1023.3 ^{ab}	82.86
Cold carcass w _(gm)	828.9 ^a	1140.0 ^b	1096.7 ^b	1002.8 ^{ab}	1018.3 ^{ab}	82.36

^{a, b} Values with a row bearing different super scripts differ significantly ($p < 0.05$)

T_c = Control diet

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T_k = KOUDIJS pre starter

T_g = GROBEL pre starter

T_n = NUTRISTAR pre starter

SEM = standard error of the mean

Table (7) The effects of dietary pre-starter treatments on non carcass parameters of six week age broiler chicks:-

Parameters	Dietary treatments					SEM
	T _c	T _w	T _k	T _g	T _n	
Blood weight(g)	50.55	48.33	54.44	48.33	54.45	5.82
Feather weight(g)	58.89	72.67	75.00	73.33	78.33	9.87
Abdominal fat w(g)	13.85 ^a	19.64 ^{bc}	22.49 ^c	16.34 ^{ab}	21.61 ^c	1.70
Giblets weight (g)	184.62	225.63	244.61	214.04	228.37	19.06
Offal weight(g)	326.08 ^a	398.95 ^{ab}	400.67 ^{ab}	385.68 ^{ab}	412.88 ^b	25.86
Intestine length(cm)	202.67	213.11	215.22	204.33	206.56	6.46
Intestine weight(g)	89.04	98.69	97.38	79.63	95.54	9.10

^{a, b} Values with a row bearing different super scripts differ significantly ($p < 0.05$).

T_c = Control diet

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T_k = KOUDIJS pre starter

T_g = GROBEL pre starter

T_n = NUTRISTAR pre starter

SEM= standard error of the mean

Conclusion and recommendations

- ❖ Since the overall goal of current study was to determine if the use of the imported commercial pre-starter diets during the first week of age could cause a progressive significant beneficial effect on broiler performance and carcass attributes or not. The obtained results have demonstrated that feeding broiler chicks pre-starter diet during the first week of age significantly enhances their growth performance and their carcass weight.

- ❖ Information of this study strongly confirms the beneficial effect of the pre-starter diet specially on body weight of broiler chicks during early, mid and late stages of their growing phases.
- ❖ Furthermore, the imported pre-starter diets are significantly different in their performance capacity and the type of the pre-starter diet will determine its enhancing power, benefit or trend (carcass versus non carcass products). For instance, WAFI and KOUDIJS in this study were most likely superior than their counterparts GROBEL and NUTRISTAR.

❖ Based on the results of this study one can recommend further studies about the inconsistent effect of the latter two pre-starter diets in addition to economic appraisal of the results.



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