Factors affecting meat yield in briolers

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This experiment was carried out at Poultry ReseachFarm. belonging to Animal Production Department,Facultyof Agriculture. Zagazig University. Benha branch.Two experiments were oonduoted :1. The first was designed to find out the possibilityof improving any undesirable effect resulting fromlowering the dietary protein level by usingconvenient level of calcium and vito 0 which areassumed to improve the protein utilization.2. The second was carried out to improve the meatplatability by sub~tituting a part of animalprotein in diet with single cell protein (yeast).A total number of 630 and 210 day-old Hubbardhybrid chicks were used in first and second experiment.respectively.All chicks were wing banded at hatch, weighed.vaccinated and kept under similar and standardconditions of management.nutrition.Chicks of the first experiment were divided intothree major groups each of 210 chicks fed dietsenvironment. hygein andcontaining 20. 22. and 24~ total protein respectively,from hatch to the 21st day of age, lowered to 18, 20173and 22% respectively therafter.Chicks of each major group were divided into threemajor subgroups each of 70 chicks receiving 1.0%. 1.3%and 1.9% dietary Calcium levels. respectively. Chicksof each calcium level were Provided with either 2200 or5120 I.U. vitamin D (each of 35 chicks).Chicks of the second experiment were grouped intotwo main groups each of 105. receiving diet containing23:20% and 23~18% total dietary protein, respectively.Each group was then subdivided into three subgroups<each of 35 chicks) receiving 5 and 2% of their dietarytotal protein from fish meal. yeast and a mixture ofthe both. respectivelY.Body weight was weekly and individually recordedto the nearest gramm along the experimental period.Weight gain and rate of growth between two succassiveweeks were individuallY calculated.Feed comsumed by allchicks of each treatment was daily recorded. averagedand expressed in gramms per day per chick. Feedefficiency was then calculated as a ratio between gainweightlengths<gm) and feed intake <gm). Shank and keelwere weekly and individuallY measured to thenearest (mm) after the end of the first week and thenweekly up to the end of the experimental period.Slaughtering and carcass quality measured at 56thday of age. Water holding capacity in meat samples weremeasured for chicks of the second experiment only.Total protein, plasma albumen, calcium andinorganic phosphorus were determined in the firs~experiment, while total protein, plasma albumen andplasma and tissues uric acid were measured in thesecond experiment. In addition, at the end of the firstexperimental period calcium absorption rate for eachintestinal part was determined in vivo in the form oftotal calcium absorption and absorption per (cm)175b - Dietary oaloium level wa. found to have signifioanteffect on body weight of chicks allover theexperimental period except at the 2nd and 4th weeks.Applying 1.0~ dietary calcium level mostly improved theaverage body weight of broiler chicks while increasingits level reduced this average.c - Chicks fed 2200 I.U. I kg ration of vit.D hadhighest average of body weight especially at 2~,5th and 6th weeks of age than those fed 5120 I.U.vito 0 whioh had the highe.t average of body weight atl~, 4th and 7th wk. of age.2 - Body weight gain.a -Chicks fed on 24~ protein showed the highestweight gain averages from the 2na to 7tn wk, while thelowest weight gain averagss were obsorved in chicks fedthe3th,of20~ protein.b - Calciu. level of l.OS showed the highest bodyweight gain averag •• followed by 1.3 and 1.9. levels,respectively.c - No .llnificant variation in weilhtaverage was found due to vito 0 supple.entationduring the last week.3 - Rate of growth.a - Birds fed 24. protein had the highest growthrate allover the expert.ental period (grand avera.e47.40~) followed by tho•• of chicks fed 22 and 20Slainexcept17~levels of protein. respectively.b Variation in arowth rate due to dietarycalcium level was found to be sianificant durin,

theperiods of 0 -1. 1 - 2 and 3 - 4 wk. only. Chicks fed1.0. dietary calcium had the highest rate of growthfollowed by those fed 1.3 and 1.9~ dietary calciumcontent, respectively.c - Vita 0 level showed no significant effect onthe rate of arowth at all 8xpeTimental period except ato -1 and 6 - 7 wk. aae.4 - Keel and shank len,ths.a - Chicks fed diet containing 24~ protein showedthe hi,hest keel and shank lenaths when compared withthose fed on either 22 or 20~ protein diets,respeotl-vely.b Dietary calciu. level was found to haveslanificant .ffect on keel and shank lengths alonl theexperimental period.c Insignificant effect was found in keel andshank lenlths due to dietary vita 0 suppl ••entation inall e.tlaation periods except at 1~, 6th and 7th weeksfor keel len.th and at 2nd. 6th and 7th weeks for shanklen.th. At these ages.5120 I.U. vito D. supple.entationincreased averaae keel and shank lenaths when co.paredwith 2200 I.U. supple.entatlon.1T7II - Feed oonBultption and .ft lelency Ja - Feed consumption average per chick per day allover the experimental period was lower (54.56 gm) inchicks fed 20S dietary protein, while this average wassimilar in chicks ted either 22 or 24S dietary protein(approximately 56.35 gm). Dietary protein level wasfound to have significant effect on these trait alongthe experimental period.b - Vito 0 had no si,nificant effect on the amountof feed oonsumption except at the 7~ w.ek.c Fe.din. chicks 1.0S dietary calcium levelresulted in increasing the average of teed consumption(57.96 amI chick Iday)followed by those fed 1.3 and 1.9Sdietary calcium, which had average of feed consumptionof 55.10 gm and 54.13 gm, respectively.d~l.tary protein level was only the factor thataffect feed efficiency. Chicks fed diet containina 24Sdietary protein .howed the highe.t averals. (0.475) ofteed efficiency than those fed 22 and 20S dietaryprotein, which showed 0.423 and 0.371 respectively.111 - Carcass quality .easure.ents :a -Birds fed 24S dietary protein had tne highestabsolute and proportional veilhts of blood, feathersand inedible ••at folloved by those ted 22 then by 20_dietary protein.b Feedine ohicks diets containing 1.9~ calciumdecreased the absolute and proportional weight of bothfeathers and inedible parts of carcass while itincreased the absolute and proportional weight ofblood.c Vit.D at a rate of 5120 I.U.increased theproportional blood weight and absolute and proportionalweight of feather, it decreased the absolute weight ofblood and the absolute and relative weights of inedibleparts of careas •• However, analysis of variance did notshow a silnificant effect due to any factor under studyor the interactton between them, except tn case ofabsolute weicht of inedible part of carcass whichshowed significant response to the effect of thedietary protein.d Chicks fed 24~ dietary protetn had the hilh ••taverage of absolute weight of carcass and lib lets,however the lowest av.r •••• were observed in tho.e fed20 and 22. dietary protein, respectively. Low dietaryprotein content decreased absolute total edible .eatwhile it incre.sed its proportional weight.s - Feeding broiler chickS diet containing 1.3~ calciumresulted in increasing absolute and proportionalweights of total edible .eat, carea.. and giblets.while a low percentals of dietary celciu. aa.tlydecreased these weights. Significant effect of dietarycalcium was found on the absolute weight of carcassonly.f - Variation in all stUdied parameters due to vit.Dsupplementation were not significant.VI - Serum blood parameters :a Serum calcium content was significantlyaffected with dietary calcium level, while nosignificant variations in this trait were observed dueto dietary protein level or vito 0 supplementation.b - No significant variation in serum inorganicphosphorus level were found due to any faotor studied.c Average of plasma total protein level washi.her (3.41 mg/l00 ml> in chicks fed 24. dietaryprotein followed by those fed 22 (3.28>. Analysis ofvariance for data showed significant .ffect due todietary protein content on plasma total protein level.d - Birds fed 1.3~ dietary calcium had the highesttotal protein level (3.33 ml/l00 ml), followed by thosefed 1.9. dietary calcium (3.29 mg/l00 ml).e Chicks fed 5120 I.U./kg ration vit.D hadrelatively the hi.her average of plas.a total protein(3.33 mg/l00 ml) followed by those fed 2200 I.U••However, analysis of variance showed insignificanteffect of either dietary calcfu. content and vit. D.supplementation.f - No significant variation in serum albumen contentwere found due to any factor studied or due to theinteraction between them on this trait.VII - Parameteers of calcium absorption rats:a - Ileum had always the higher average of boththtotal calcium absorption. calcium absorption/emlength/hr or per gm dry matter.b Dietary protein level showed significanteffect on the total calcium absorption only.On the other hand. dietary calcium level showedsignificant effect on the absorbed amount/cm length/hronly.c - Vit.D supplementation showed no .ilnifioanteffact in aJ I parameters of calcium absorption rate.b - Values of the correlation coefficient betweenthe rate of caJcium absorption per

either 1 cmintestinal lenjth orper1 1m intestinal dry weight andtotal lengths or total dry wellhts of differentintestinal relion. differed in their magnitudeaccord1n, to either inte.tinal part or the proteinlevel. However. they were allot hilh and positivevalue.a.oood .xp.rt ••nt I1. Para •• tars of growth pertor.ance1. Body wei,ht.a - Highest body weilht average (1262.12 g_> wasfound in chicks fed fish meal as a source of animalprotein.b - Dietary protein levels and source had significanteffect on the average of body weight from the 4th wk<in case of protein source> or from the 3rd wk <incase of protein level> up to the end of theexperimental period.2. Weight gain:Dietary protein source showed significant effecton average body weight gain at 4th and 5th wks ofchicks age, while the effect of protein level wassignificant from the 3rd wk up to the end ofexperimental period.3. Rate of growth.Significant variation in average growth rate wasfound, during 2 - 3, 3 - 4 and 4 - 5 wks of age due todietary protein source. However, dietary protein levelwas found to have insignificant effect on the rate ofgrowth along the experimental period except during 2-3wk of chick's age.4. Keel and shank lengthsa - Dietary protein source affected keel length ata 11 agesvariationexcept at 1~ and 6th weeks. However,in shank length due to this treatment wasobserved allover the experimental period except at1~, 3rd and 4th weeks of chicks age.b - Dietary protein level significantly affectedaverage of keel length during the period from the 1~wk to the 5th wk of chicks age.II Feed consumption and efficiency:Feed consumption varied significantly at 6ih wkaccording to dietary protein source, while significanteffect was found at 2nd and 5th wks for dietary proteinlevel. No significant variation in feed efficiencycould be detected due to either dietary protein sourcesor levels.III - Parameters of carcass quality:a - No significant effect was found due to dietaryprotein levels or source and the interaction betwe.nthem on various traits of killina, dressing andeVisceratin, losses except the absolute weight of bloodwhich showed sianificant response to dietary proteinsubstitution.b - Sianificant variations due to dietary proteinsource were found in absolute weights of edible meat.Variations In all traits <except in proportionalweights of total edible ••at and :carcas.) due todietary protein level were 8lgnificant.c - No significant variation In water holdingcapacity due to either dietary protein level, source orthe interaction between the••VII - Serum blood indicators:1 - Serum total protein.Insiginficant variation in serum total protein dueto dietary protein source was observed. However, animalor sinale cell protein sUbstituting level significantlyaffect average of serum total protein content.2 - Serum albumen content.Insignifioant variation in average serum albumendue to either protein level, source or the interactionbetween them was found.3 - Serum and tissues uric acid.Serum uric acid averaged 34.10, 37.35 and 38.70.g/100 ml in chicks fed fish meal, yeast or fish mealand yeast, respectively. The corresponding averages intissue. were 26.45,31.08 and 38.10 mlll00 ml,respectively. However, no significant effect due toeither dietary protein sources or levels on avera,e ofserum or tissues uric acid level were found.