The use of some agricultural by products in brioler diets

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This study was carried out at the Poultry Experimental Station, Poultry Production Department, Faculty of Agriculture, Ain Shams University during year 2003. The chemical analysis was conducted at laboratories of the central laboratory for food and feed (CLFF), Agriculture Research Center, Giza, Egypt.The aim of this work was to study the effect of adding tomato by-product meal (TBM), potato by-product meal (PBM), pea hulls meal (PHM) and date stone meal (DSM) at levels of 5, 10, 15 and 20% in broiler diets on chick performance, nutrients digestibility, carcass characteristics and economic efficiency.A total number of 459 unsexed one day old ”Hubbard” broiler chicks were used in this study. At the first week of age, all chicks were fed a commercial basal diet contained 23% CP and 3000 Kcal ME/Kg diet according to NRC (1994) recommendations, then chicks were randomly distributed into 5 groups of approximatly equal average LBW. The first group contained 27 chicks with three replicates of 9 chicks each and used as control group for each tested by product meal. The remainder 4 groups, each contained 108 chicks sub divided into four dietary treatments each with three replicates of 9 chicks.Chicks were fed on 17 starter diets from 1-3 weeks of age (starting period), after which chicks were switched to be fed on 17 grower diets from 3 to 7 weeks of age (growing period) and finally chicks were fed on 17 finisher diets during the finishing period (7 to8 weeks of age). Starter, grower and finisher diets wer formulated to be nearly isonitrogenous and isocalorric and adjusted to cover the nutrients requirements of growing chicks according to the NRC (1994). The CP contents ranged from 22.80 to 24.20% for starter diets, 19. 90 to 20.30% for grower diets and 17.70 to 19.80% for finisher ones. The ME values varied between 300 and 3053 Kcal/Kg for starter diets; 3076 and 3126 Kcal/Kg for rower diets and 3064 and 3231 Kcal/Kg for finisher ones. The s er, grower and finisher diets (except control ones) included four 1 vels (5, 10, 15 and 20%) from each of TBM, PBM, PHM and DSM. Each starter diet was assigned to one group of chicks at random during the starting period, then chicks of this group were switched to the respective grower and finisher diets during the grower and finisher periods, respectively.At the termination of the experimental period (8 weeks of age), 17 digestibility trials were conducted to d termine the digestibility values of different feed nutrients of the finisher experimental diets. Also, a slaughter test was perform d at the end of the experimental period to study carcass characteristics of chicks fed the experimental diets.Results of this study could be summarized as follows: Chemical analysis.1- Chemical analysis of the tested by-product nials showed that the highest value of OM was recorded by DSM (98.68%) and the lowest value was showli by TBM (82.77%), while the other tested by-product meals have-178- Summary and Conclusionintermediate values being 90.33 and 86.72% for PBM and PHM, respectively.2-The percentage of CP in PHM recorded the highest value (25.74%) followed by TBM (22.83%), while DSM had the lowest value (7.36%).3-The percentage of EE in DSM achieved the highest value (5.72%) followed by TBM (2.54%), whereas the lowest EE values were shown by PBM and PHM being 0.80 and 0,90%, respectively.4-The highest values of CF were record by TBM (30.89%) followed by DSM (29.88%) and PHM (20.11%) and the lowest value (14.25%) was shown by PBM.5-The highest NFE values were recorded by PBM and DSM being 56.90 and 55.72% respectively, followed by PHM (39.97%) and the lowest value (26.51%) was shown by TBM.Amino acid contents.1- Amino acid contents of tested by-product meals cleared that DSM had the highest

level of argnine followed by TBM, while PHM showed the lowest one. The highest levels of lysine, histidine and phenylalanine were recorded by TBM followed by PBM, while DSM recorded the lowest levels of these amino acids. Values of leucine, isoleucine, valine and threonine in PBM recorded the highest levels followed by TBM, while DSM showed the lowest levels of leucine andIN 1 1 • 1isoleucine and PHM recorded the lowest values for valine and threonine. The highest methionine value was shown by TBM followed by DSM and the lowest one was recorded by PHM.2-Results of amino acid contents of tested by-product meals revealed that TBM and PBM contains better essential amino acid balance than PHM and DSM.3-Based on broiler chick requirements for essential amino acids (NRC, 1994), the first, second and third limiting amino acids of TBM were, threonine, valine and lysine, respectively and the corresponding ones for PBM were argnine, methionine and lysine. whereas, valine, arginine and threonine in PHM were the first, second and third limiting amino acids, respectively, and lysine, phenylalanine and threonine were the corresponding ones in DSM.First feeding experiment (tomato by-product meal). Growth performance.1- Broilers fed 5% TBM recorded the highest LBW and WG values followed by those fed the control diet, while those fed 20% TBM achieved the lowest ones. The differences in either LBW or WG values between chicks fed the control diet and those fed 5% TBM were mostly non-significant during all the experimental periods. However, both LBW and WG values of chicks almost decreased with increasing the dietary TBM level during all experimental periods.-180- Summary and Conclusion1GO/ a 1f10/age periods. whereas, chicks fed 20% PBM consumed the lowest amounts of FI at all experimental periods. However, there were no significant differences in FI consumed by chicks fed the control diet and those fed either 5, 10 or 15% PBM during the whole experimental period.3- Chicks fed 5% PBM recorded the best FC values during all the experimental periods followed by those fed the control diet, with no significant differences. whereas, chicks fed higher levels of PBM (10, 15 or 20%) achieved higher (poorest) FC values. The differences in FC values between chicks fed either 5% PBM or the control diet and those fed higher levels of PBM (10, 15 or 20%) were significant, while increasing the level of dietary PBM from 10 to 15 and 20% had almost no significant effect on FC values.Digestibility.The diet contained 5% PBM recoded the highest digestibility values for all feed nutrients followed by the control diet, whereas, the diet contained 20% PBM achieved almost the lowest ones. Digestibility values for most nutrients of the finisher diets tended to decrease as the dietary PBM level increased.Carcass traits.The highest carcass and edible parts percentages were recorded by chicks fed 10% dietary PBM followed by those fed 5% and 15% PBM, with no significant differences, while the lowest ones were achieved by birds fed 20 % dietary PBM. Chicks fed the diet with 5% PBM had the highest hind legs, thigh, drumstick,-183- Summary and Conclusionbreast, total meat, total bone, breast meat and hind legs meat percentages. whereas, those fed 20% PBM recorded the lowest respective percentages except drumstick one. All carcass characteristics (except non carcass fat) and carcass cuts percentages were significantly affected by the level of dietary PBM.Economic efficiency.The price of one Kg feed decreased with increasing the dietary level of PBM, the diet contained 20% PBM showed the lowest one. The control diet achieved the lowest cost / Kg WG and showed the best economic feed efficiency value followed by the diet contained 5% PBM, while the diet having 15% PBM showed the highest feed cost / Kg WG and recorded the lowest (poorest) economic feed efficiency value.Third feeding experiment (pea hulls meal). Growth performance.1-Results of this experiment indicated that the highest LBW and WG values were recorded by chicks fed the control diet and 5% PHM at all experimental periods. Increasing the dietary PHM level had an adverse effect on both traits and the differences were almost significant.2-Chicks fed the control diet consumed the highest ($P<0.05$) amounts of FI during all experimental periods, followed by those fed 5% PHM. However, the amounts of feed consumed by chicks tended to decrease with increasing the dietary PHM level but the differences were mostly non significant.-184- Summary and Conclusion3- The best FC values during all experimental periods were recorded almost by chicks fed 5% PHM followed by those fed the control diet, with no significant differences between the two treatments. Increasing the dietary PHM level had detrimental effect on FC values. The poorest values ($P<0.05$) were recorded by chicks fed 15 and 20% PHM during all experimental periods.Digestibility.Chicks fed the diet with 5% dietary PHM recorded the highest digestibility values

for all nutrients except NFE digestibility, whereas, those fed the diet contained 20% PHM achieved the lowest ones except EE and NFE digestibilities. Increasing the dietary PHM level from 5% to 10, 15 or 20% almost decreased the digestibility values of feed nutrients.Carcass traits.Chicks fed the diet with 5 % PHM recoded the best carcass and edible parts percentages followed by those fed the control diet, while chicks fed 15% dietary PHM achieved the lowest percentages of both traits. Broilers fed 5% PHM treatment recorded the highest percentages of all carcass cuts except for wings and total bone ones. whereas, those fed 15 and 20% PHM treatments showed the lowest percentages of all carcass cuts. The differences in carcass characteristics and carcass cuts percentages due to PHM level effects were almost significant.-185- Summary and ConclusionEconomic efficiency.The control diet recorded the highest price of one Kg feed, whereas, those containing different levels of PHM showed lower price for each one Kg feed. Increasing the dietary PHM level decreased almost the price of each one Kg feed. The diet contained 5 % PHM achieved the lowest feed cost / Kg WG followed by the control diet, while, the highest feed cost / Kg WG was shown by the diet contained 15% PHM. Also, the diet with 5% PHM showed the best economic feed efficiency value followed by the control diet, whereas the diet having 15% PHM recorded the lowest value.Fourth feeding experiment (date stone meal). Growth performance.1-Chicks fed 5% DSM and the control diet recorded the highest LBW values at different ages of the experimental period and increasing the dietary DSM level decreased LBW values, almost significantly. Averages of WG values during the different experimental periods showed the same trend observed with LBW as averages of WG values decreased, mostly significant as dietary DSM level increased. Chicks fed 5% DSM and the control diet recorded the highest WG values, whereas those fed 20% DSM showed the lowest one.2-Feed intake decreased with increasing the level of DSM in the diet during all experimental periods. The highest amounts of Fl were recorded by chicks fed 5% DSM followed by those fed 10% DSM and the control diet and the-186- Summary and Conclusiondifferences were not significant in most cases. whereas, chicks fed 20% DSM consumed the lowest amount of Fl.3- Increasing the dietary level of DSM had detrimental effect on FC values of broiler chicks during all experimental periods. The best FC values were recorded by chicks fed 5% DSM followed by those fed the control diet, with no significant differences. whereas, the poorest values were achieved almost by chicks fed 20% DSM.Digestibility.Broiler chicks fed the control diet recorded the highest DM, OM, CP and NFE digestibility values, while those fed 5 % DSM achieved the highest EE and CF ones. whereas, chicks fed 20 % DSM showed the lowest DM, OM, CP and CF digestibilities and those fed 15% DSM recorded the lowest EE and NFE ones. Increasing the dietary DSM level from 5% to 10, 15 or 20% almost significantly decreased digestibility values.Carcass traits.The highest carcass and edible parts percentages were shown by chicks fed 10% dietary DSM followed by those fed 5% dietary DSM, while those fed 20% dietary DSM recorded the lowest ones. whereas, chicks fed 5% DSM had the highest hind legs, drumstick, breast, total meat, breast meat and hind legs meat percentages. The lowest percentages of most carcass cuts were recorded by chicks fed 15 and 20% DSM. The differences in most carcass-187- Summary and Conclusioncharacteristics and carcass cuts percentages due to DSM level effect were significant.Economic efficiency.Increasing the dietary DSM level decreased the price of one Kg feed. The lowest feed cost / Kg WG and the best economic efficiency value were shown by the control diet followed by the diet having 5 % DSM, whereas, the highest feed cost /Kg WG and the lowest (poorest) economic efficiency value were achieved by the diet contained 20 % DSM.In conclusion, the agricultural by-product meals, TBM and PHM could be safely and economically used at the level of 5% in growing broiler chick diets without any adverse effect on the growth performance and carcass characteristics. whereas, adding any level from either PBM or DSM to broiler diets had no economical benefit as the control diet recorded higher EEf values than did the diets contained these two by-products.