

**Correspondence of article: Energy and Protein requirements of for Female Arabic Hens During Rearing Period**

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Date: June 16, 2020

**PAPER EVALUATION**

**Paper Title: Energy and Protein requirements of for Female Arabic Hens During Rearing Period**

Comments (please use additional paper if more space is needed)

No	Comments	Author's response
<b>A</b>	<b>Reviewer I (MB1)</b>	
1	Overall a good paper and has scientific merit to be published.	We would like to express our heartfelt thanks to reviewer on evaluation our manuscript that has scientific merit to be published.
2	Introduction: you discussed a lot about local village chickens, yet your experiment is Arabic chickens (not village chicken). Please explain the breed of chickens used.  Please add novelty of your manuscript before resuming the objectives.	Kompiang et al (2001) used Kampung/local village chicken without mentioning the sex of the chicken. Hidayat et al (2011) use KUB chicken (local village chicken selected for egg production)  However, it is not known what kind of diet the Arabic chicken will select from various diets varying in protein and energy contents to compose their nutrient requirements that suitable with their physiological development conditions. This selection may result in a faster growth rate and onset of lay compared with control diet. (line 52 to 56)
3	For the choice fed treatments: Why is it necessary to have the control diet offered together with other four diets? Wouldn't offering the four diets give similar effect? It would be expected that offering the 4 diets	This is a very critical question. We do not know for sure that what are the energy and protein needed

	<p>would give the birds the ability to choose the best combination of diets to meet their protein requirements.</p>	<p>for Arabic chicken. We assume that the control diet may be suitable because the body weight of Arabic chick was 10 % lower than that of the targeted mean BW of Hyline Brown chick. If the control diet is fit for them than the other diet will not be selected.</p> <p>We think that we need to test by offering 4 diets without control diet to see if the Arabic chickens will compose similar energy and protein as 5 diets.</p>
4	<p>You had weeks as a factor for each phase. It is expected that there would be variations in intake between weeks due factors like fluctuation in temperature and humidity, noise, management, etc. I would suggest for each phase to analyze your results using a factorial design, 2 x (no of weeks) for each phase to see if there are differences in the treatment. Wouldn't it be better also to compare the differences in feed intakes, intakes of CP and ME, FCR, and CP and ME utilization between the phases. This would give you justifications why the phases were made as such. Remember the growth curve is always sigmoid, and that the protein in the diets is lower as the birds get older.</p>	<p>Factorial experimental design is one method to discover which factors influence the outcome of the experiment and what levels of these factors lead to an experiment with the greatest sensitivity. In general, factorial design has many factors and each factor has at least two levels. However, we did not level the CP and ME concentration in the diet. Moreover, all 5 diets were offered together. Therefore, the amount of feed intake, CP and ME intake, BWG were influenced by every diet because the chicks consumed all the diets offered.</p> <p>Since the data were taken repeatedly on the same animals, they could not be considered as separate units of observation (Littell et al., 1998; Walter et al., 2018).</p>

		<p>Therefore, we used a PROC MIXED PROC to account for the covariance structure among repeated observations. Parameters measured in the second week was dependent on the situation in the first week and so forth due to factors like fluctuation in temperature and humidity, noise, management, etc. Time (week) was used as a factor in the analysis. Therefore, in the analyses we could compare the difference in the treatments not only within a week but also between weeks in each phase (Table 1 line??). We limited our analysis in each phase not between the phase, because we aimed to estimate the CP and ME requirements for each phase. Although it would be nice to see the difference between phases.</p>
5	<p>I have made some comments on the manuscript. The title I think should be improved. I suggest: Protein and Metabolizable Energy intakes of Arabic female layer chicks when fed a free-choice diet containing varying levels of protein and energy.</p>	<p>We agree to change the title but we limited the number of word by the rule of this journal policy. We suggest to change the title as follow: <a href="#">Estimating of Energy and Protein Requirements for Arabic Chicken During Rearing Period by Free Choice Feeding</a>'. We would like to estimate the energy and protein requirement for female rather than just intake of energy and protein. Of course, to estimate energy and protein</p>

		requirements, we must measure the intake of energy and protein.
6	Also the use of terms: chicks are from day old to 6 weeks, pullets are until point of lay, hens are usually females that are laying eggs.	We agree to use the term in the manuscript.
<b>B</b>	<b>Reviewer II (MB2)</b>	
1	The detailed comments are embedded in the text	Thank you so much for your comments
2	The manuscript needs English revision and correction by English editor.	Yes, language was not edited by the English editing service yet. We only used the Grammarly.com as a grammar checker. After finishing the correction from the reviewers and editor, we will use an appropriate English Editor Service.
3	<p>References</p> <p>a) Please ensure that every reference cited in the text is also present in the reference list (and vice versa).</p> <p>b) Please also ensure that references from the last 10 year journal publications should be more than 80%.</p>	<p>a) We used Mendeley reference program to ensure the reference cited in the text present in the reference list</p> <p>b) For now, references from the last 10 year journal publications is 80%.</p>

Date: July 15, 2020

### THE REVIEW RESULT

Paper Title: **Estimating of Energy and Protein Requirements of Arabic Hens During Rearing Period by Free Choice Feeding**

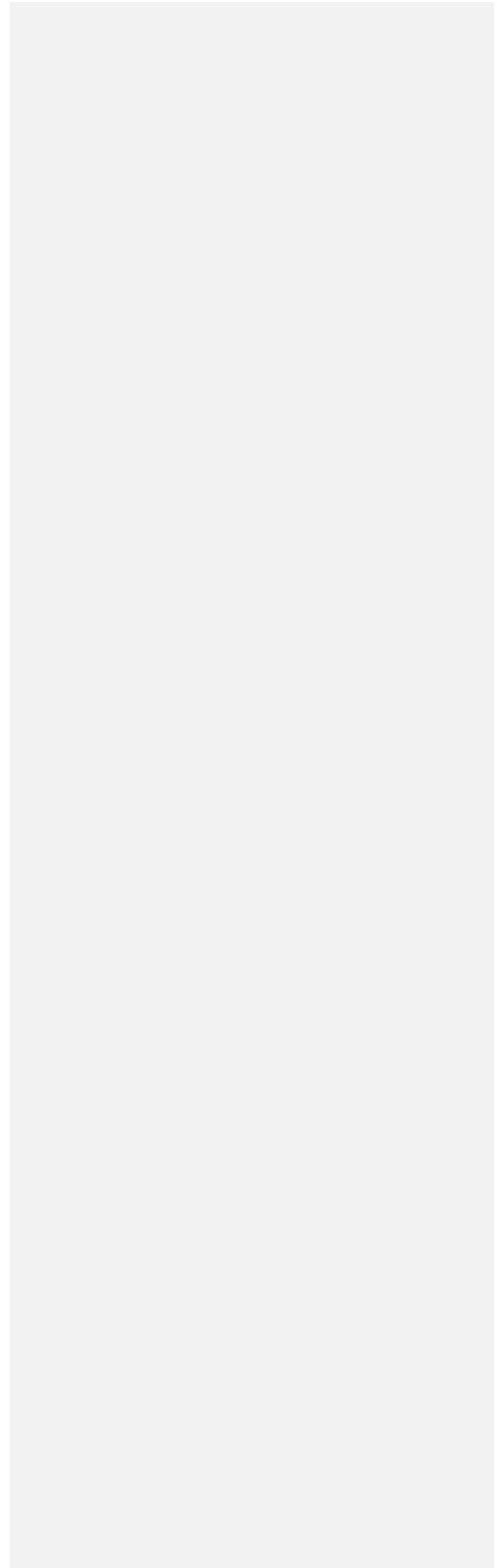
Comments (please use additional paper if more space is needed)

No	Comments	Author's response
1	<p>Abstract :</p> <ul style="list-style-type: none"><li>- The exact level of protein and energy of each treatments should be written clearly</li><li>- Please describe the result clearly, which treatment that resulted the best performance</li></ul>	<ul style="list-style-type: none"><li>- We wrote the level of protein and energy of each treatments in the manuscript. (Line 9 to 14)</li></ul> <p>‘a control diet (starter period: 2910 and 19.7; grower period: 2854 and 17.5; developer period: 2754 and 16.0; pre-laying period: 2776 and 16.5; and laying period: 2814 and 18.4; kcal of ME/kg and % of CP, respectively) together with four other diets (high energy-high protein [3101 and 23.0], high energy-low protein [3133 and 14.3, low energy-high protein [2638 and 23.4], and low energy-low protein [2677 and 14.6]; kcal of ME/kg and % of CP, respectively).’</p> <ul style="list-style-type: none"><li>- We described the results clearly by showing which treatments that resulted the best performance in the manuscript. (Line 15 to 21)</li></ul> <p>‘Results showed that ME and CP intakes were similar in all periods. However, ME and CP concentrations were higher in choice dietary treatment in all periods, except CP concentration in starter period. BWG started to be higher in choice dietary treatment during developer and pre-laying period. ME and CP requirements for starter and grower periods were similar with the control diet. However, choice dietary treatment resulted in a higher growth rate during developer by 3091 kcal of ME/kg and 18.5% of CP and during pre-laying by 3073 kcal of ME/kg and 18.8% of CP. The onset of lay was two days early in choice-fed birds.’</p>

2	<p>Materials and Methods :</p> <ul style="list-style-type: none"> <li>- Why the range of level energy and CP very far? 23% Vs 14.3% for CP and 3133 kcal vs 2638 kcal for energy?</li> <li>- What analysis used to check the means separation?</li> </ul>	<p>In order for the birds to choose effectively, the feeds or diets need to be nutritionally distinct (Syafwan et al., 2012; Fanatico et al., 2016).</p> <p>We used Least Significant Difference (LSD) in comparing the means when the main effects or their interactions were significant. (Line 112 to 116)</p> <p>To check the means separation, we used <b>pdmix800.sas macro</b>. This macro, for use with multiple means comparison from a Proc Mixed analysis, was written by Dr. Saxton, University of Tennessee. His research focus is in Animal Science but it can be used in all fields. The macro converts the matrix of PDIFF values generated from an all-possible pairwise means comparison test into the more digestible a ab abc... format for conveying which means differ from which. The means compared can be either simple main effect means or interaction means. You specify whatever multiple means comparison adjustment you need in the lsmeans statement (such as pdiff adjust=tukey); the macro takes the SAS pdiff table and compresses the differences into the letter format.</p>
3	<p>Results :</p> <ul style="list-style-type: none"> <li>- Please add the correlation analysis between level of energy with performance and also between level of CP and performance?</li> <li>- Do you use factorial design in the treatments which separated by week? Please check the design of experiment</li> </ul>	<p>We added the correlation analysis between level of energy with BWG and also between level of CP and BWG in the revised manuscript. (Line 238-246)</p> <p>We discussed about this correlation in Line 332-340</p> <p>Table 7. Correlation between ME and CP level with BWG (Line 490).</p> <p>No. we did not use a factorial design. We used a completely randomized design and measurements were repeated every week on the same experimental unit.</p>

	<p>and revise in the all results description</p>	<p>According to <b>Littell et al., (1998; Statistical analysis of repeated measures data using SAS procedures. J. Anim. Sci.)</b>, repeated measures experiments are a type of factorial experiment, with treatment and time as the two factors. They have been used commonly in animal and plan for several decades, but only in recent years have statistical and computing methodologies been available to analyze them effectively and efficiently with SAS Software.</p> <p>The new article about <b>“The use of MIXED models in the analysis of animal experiments with repeated measures data” (Wang and Goonewardene, 2004. Can. J. Anim.Sci.)</b> stated that the repeated measures experiment is a common design in animal science research and the analysis refers to multiple measurements made on the same experimental unit, observed either over time or space. In repeated measures designs, the usual practice is to apply treatments to experimental units in a completely randomized design and measurements are made sequentially over time. <b>With this type of experimental design, there are basically two fixed effects (treatment and time) and two sources of random variation (between and within animals).</b> Such measurements are commonly taken on subjects which have been randomly allocated to fixed treatment effects such as feeds, drugs, hormones, etc., with pens or blocks considered as random effects in the design. Sometimes a repeated measures analysis can be combined with a Latin square design and analyzed as a split-plot with multiple error terms.</p> <p>Often, measurements made on the same animal are more likely to be correlated than two measurements taken on different animals, and two measurements taken closer in time on the same animal are likely to be more correlated than measurements taken further apart in time. <b>The basic objectives for repeated measures data are</b></p>
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	<p><b>to examine simple factor effects (main effects) and the interaction effects between them.</b> The distinguishing characteristic of the repeated measurements analysis model from other models is the assumption about the error variance and covariance structure. With the repeated model, the usual assumptions about error variances being independent and homogeneous are no longer valid. The analysis of repeated measures data therefore requires an appropriate accounting for correlations between the observations made on the same subject and possible heterogeneous variances among observations on the same subject over time.</p> <p>Mixed model methodology, as implemented by MIXED procedure, make it possible to analyze repeated measures data correctly and efficiently by first modeling the variance and correlation structure of the repeated measures. Then the estimated covariance structure is used to obtain generalized least square estimates of treatment and time difference. Analysis of contrast variables using the GLM repeated statement or univariate analysis of variance using the GLM procedure is avoid or ignore covariance structure. Avoiding the covariance structure result in inefficient analyses, which is tantamount to wasting data. Ignoring the covariance structure result in incorrect conclusion from the statistical analysis.</p> <p>We think that a mixed procedure in SAS was suitable to analyze our data from a completely randomized design and measurements were repeated every week. By using a mixed procedure, we were able to analyze the main effect (treatments and week) and the interaction effects between them.</p> <p>We hope that our explanations could make clear the reason not to use a common factorial design to see the main and interaction effect for our experiment. However, we are happy to see your</p>
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		comments and open to analyze our data by common factorial design if still necessary.
4	<p>Conclusion :</p> <ul style="list-style-type: none"> <li>- Please clearly describe the conclusion which level of energy and CP level that result in the best performance?</li> </ul>	<p>Self-selection feeding method gave an opportunity to hens adjusting their nutrient requirements as indicated by the greater ME and CP concentrations in the diet consumed. ME and CP requirements for starter and grower periods were similar with the control diet. However, choice dietary treatment resulted in a higher growth rate during developer by 3091 kcal of ME/kg and 18.5% of CP and during pre-laying by 3073 kcal of ME/kg and 18.8% of CP. The onset of lay was two days early in choice-fed birds. (Line 342-347)</p>

## Dear Reviewers

First of all, we would like to express our heartfelt thanks and appreciation to the reviewers. All reviewers' comments were relevant to a better understanding of the paper.

The language was not edited by the editing service yet. Suggested changes were accepted. We accepted almost all the corrections. We try to clarify all doubts presented by the reviewers at the end of each comments.

### Responses to Reviewer 1

Line 1. Title: '**Requirements of Energy and Protein for Female Arabic Hens During Rearing Period**' changed to '**Estimating of Energy and Protein Requirements for Arabic Hens During Rearing Period by Free Choice Feeding**'. We would like to estimate the energy and protein requirement rather than just intake of energy and protein. Of course, to estimate energy and protein, we must measure the intake of energy and protein.

Line 4: 'The present experiment was tried to calculate energy (ME) and protein (CP) requirements' changed to '**The present experiment was conducted to estimate the metabolizable energy (ME) and crude protein (CP) requirements**' (line 4 to 5)

Line 5: 'in the tropics' was deleted

Line 6: added '**Two hundred and forty**'

Line 7: ',' replaced with '**with**'

Line 7: 'The treatments were control and choice diet consisted of 6 replicate pens' changed to '**They were offered either control or choice diet and replicated six times**'. (line 7 to 8)

Line 8: 'The control group offered a control diet observe with the Hy-line Brown Nutrient Requirements Standard,' changed to '**The control group were offered a diet based on the Hy-line Brown Nutrient Requirements Standard,**' (line 8 to 9)

Line 9: 'whereas the choice group offered a control and four other diets' changed to '**whereas the choice group were offered a control together with four other diets**' (line 9 to 10)

Line 14: 'composed' changed to '**consumed**' (line 14)

Line 15: 'the' was inserted between 'than' and 'control'

Line 15: 'phase' was changed to '**phases except CP concentration in starter period**' (line 15 to 16)

Line 44: 'informed that the donation'. We update the data in 2019 and the sentence was replaced as follow: **Director General of Livestock and Animal Health (2019) reported that the egg production of local village chickens decreased 3,9% from 2017 to 2018 and increased 3,7% from 2018 to 2019. The contribution of egg local village chicken to the national egg production increased only 0.08% from 2018 to 2019.** (line 27 to 30)

Line 45: 'lower in this' changed to 'poor' (line 30)

Line 46: 'describes' changed to 'suggests' (line 31)

Line 50: 'an investigation to find out' was changed to 'to' (line 35)

Line 52: 'Kampung' changed to 'local village' (line 37 to 38)

Line 54: 'Kampung' changed to 'KUB Chicken (local village chicken selected for egg production)' (line 40)

Line 56: 'This all information' changed to 'These studies' (line 42) and 'village' was added between 'local' and 'chicken' (line 43)

Line 78 to 81: 'The experiment aimed (1) to study that female Arabic hens can compose an adequate ration by offering various choice of diet vary in energy and protein contents; (2) to determine what are the protein and energy requirements for Arabic hens during growing period; (3) and to study if the onset of lay differ between treatments.' Changed to 'The objectives of this study were (1) to determine the nutrient composition of diets consumed by Arabic female chicks when offered various choice of diet varying in energy and protein contents; (2) to determine what are the protein and energy requirements for Arabic female chicks during the growing period; (3) and to determine the time of onset of lay of Arabic chicks when given choice fed diets.' (line 58 to 62)

Line 88: 'pens, 20 hens each' changed to 'pens with 20 chicks each' (line 68)

Line 90: 'wide and high' changed to 'width and height' (line 70)

Line 114 to 117: 'The no-choice hens offered a control diet based on The Hy-line Brown Commercial Management Guide (HyLine, 2011) containing ME, CP, and other nutrients for four phases (starter [0-6 wk], grower [7-12 wk], developer [13-15 wk], prelaying [16-17 wk], and laying [18 wk of age]) as recommended by' change to: 'The no-choice hens offered a control that containing ME, CP, and other nutrients for four phases (starter [0-6 wk], grower [7-12 wk], developer [13-15 wk], prelaying [16-17 wk], and laying [18 wk of age]) as recommended by The Hy-line Brown Commercial Management Guide (HyLine, 2011)' (Line 82 to 85)

Line 117 to 119: 'This recommendation was chosen because the body weight of Arabic chick was lower than 10% of the mean BW targeted of Hyline Brown chick.' Changed to 'This recommendation was chosen because the body weight of Arabic chick was 10% lower than that of the targeted mean BW of Hyline Brown chick. To be save, pre-laying control feed was stopped at 17 wk although the hens did not lay eggs yet and continued with laying standard feed from 18th wk of age until they laid the eggs.' (line 85 to 88)

Line 122 to 124: 'Each diet was supplied as mass. Dietary compositions of the diets and the nutrients content of the diets are presented in Table 1. The only big differences in nutrients content of dietary treatment are protein and energy. The other nutrients contents such as Ca, NPP and Na are similar. Thereby, the hens directed only to meet the protein and energy requirements.' Changed to 'All the diets were offered in mash form. The nutrients content of

the diets are presented in Table 1. These four diets differed from that of the control in the energy and protein contents, while the other nutrients were almost identical.' (line 92 to 94)

Line 125 to 126: 'troughs and averaged per bird per wk' changed to 'offered and feed residues on a weekly basis.' (line 95 to 96)

Line 126 to 128: 'ME and CP intake were calculated from the intake of each of the five diets times the content of ME and CP in each diet then divided by 1000 (g/kg) and were used to calculate the ME and CP utilization.' We did not change this sentence because we calculated the ME and CP intake from each diet. (line 96 to 98)

Line 128: 'determined and their BW gain was calculated' changed to 'accounted for in the calculations for their mean weekly BW gain.' (line 101)

Line 129: 'Protein' changed to 'Protein (g/g BW gain)' (line 101)

Line 147: '(ME/g BW gain)' was added between 'utilization' and 'per pen' (line 102)

Line 151: 'Data analysis has been' changed to 'Data were analysed according to the method' (line 106)

Line 152: 'since the data were taken repeatedly on the same animal cannot be' changed to 'Since the data were taken repeatedly on the same animals, they could not be' (line 107 to 108)

Line 157: 'significance' changed to 'significant' (line 112)

Line 161: 'are as the following' changed to 'were as follows' (line 116)

Line 182 to 184: 'During the experimental period, the overall average temperature and humidity from 1 to 22 wk for the respective interval were 22.0 to 25.8°C and 68 to 98% (07:00); 24.0 to 36.0°C and 40 to 82% (12:00); and 20.7 to 34.6°C and 44 to 80% (17:00)' changed to 'During the experimental period, the average temperature and humidity from 1 to 22 wk measured at 07.00 h, 12.00 h and 17.00 h were 24.2±0.8 and 78.7±3.8%, 30.4±2.2 and 54.1±7.7%, 28.7±2.2 and 60.8±8.6% respectively.' (line 128 to 130)

Line 189 to 190: 'Mortality in this study was 3.8%. All performance data in the tables are data corrected for mortality by wk.' changed to 'The mortality of birds over the experimental period was 3.8%. All performance data in the tables were corrected for mortality by on a weekly basis' (line 132 to 133)

Line 192: 'every wk' changed to 'weekly' and 'at' changed to 'on' (line 135)

Line 193: 'There was no influence of treatments on FI of the hens' changed to 'There was no significant effect of treatments on feed intake (FI) of the chicks' (line 136)

Line 243: 'wk' changed to 'week' (line 178)

Line 273-276: 'In this study, ....they laid the eggs' was moved to Line 86 to 88 and changed to 'To be save, pre-laying control feed was stopped at 17 wk although the hens did not lay

eggs yet and continued with laying standard feed from 18th wk of age until they laid the eggs'.

Line 284: 'BWG was affected by feeding method' changed to 'BWG was significantly affected by dietary treatments' (line 215)

Line 334: 'Although the hens gave a choice consumed' changed to 'Although the hens on choice-fed diets consumed' (line 263)

Line 379-381: 'Although, in two units experiment in the control-fed group were not produce egg yet until the 1<sup>st</sup> day of 22 wk of age. So, the choice-fed group was mature 3 days early than the control-fed group.' Changed to 'Although, in three units experiment in the control-fed group were not produce egg yet until the 1<sup>st</sup> day of 22 wk of age and one unit of these three units was not lay an egg until the 6<sup>th</sup> day of 22 wk of age. So, the choice-fed group was mature two days early than the control-fed group.' (line 306 to 308)

Line 382: 'mature' change 'age of point of lay' (line 310)

Line 383: 'Based on this study' changed to 'Based on BW gain of this study' (line 311)

Line 384: 'CP (%)' changed to 'CP (g/kg)' (line 312)

Line 385 to 386: 'Starter (1 to 6 wk): 3026 and 18.8; Grower (7 to 12 wk): 3081 and 18.4; Developer (13 to 15 wk): 3091 and 18.5 and Pre-laying (16 to 22 wk): 3073 and 18.9.' changed to 'Starter (1 to 6 wk): 3026 and 188.4; Grower (7 to 12 wk): 3081 and 183.9; Developer (13 to 15 wk): 3091 and 184.8 and Pre-laying (16 to 22 wk): 3073 and 188.5.' (line 312 to 313)

Line 387: 'CP requirement' changed to 'CP requirement (in terms of gr/kg in the diet consumed)' (line 315)

Line 389: 'ME requirement was higher' changed to 'ME requirement (in term of kcal/kg in the diet consumed) was higher' (line 316 to 317)

Line 398 to 400: 'The ME (kcal/kg) and CP (%) need for each period of female Arabic hens are as follow: Starter (1 to 6 wk): 3026 and 18.8; Grower (7 to 12 wk): 3081 and 18.4; Developer (13 to 15 wk): 3091 and 18.5 and Pre-laying (16 to 22 wk): 3073 and 18.9' changed to 'CP requirement for starter period was lower but for grower, developer and pre-laying period were higher than CP containing in the control diet. ME requirement was higher for all rearing period than ME containing in the control diet' (line 324 to 326)

Line 529 to 530: Figure 1. Thank you to find this mistake. We replaced the protein utilization and energy utilization graph with 1 to 6 week. (line 465)

Responses to Reviewer 2.

Line 4: 'tried' change to 'conducted' (line 4)

Line 17: 'diet'. We changed the conclusion as follow: 'Therefore, the CP and ME contents in the control diet were limiting factors except for CP for the starter period. Therefore, the CP requirement for starter period was lower but for the grower, the developer and pre-laying period were higher than CP containing in the control diet. ME requirement was higher for all rearing period than ME containing in the control diet.' (line 17 to 20)

Line 26: 'donation'. We update the data (line 27 to 30)

Line 31: References about standard diet for Arabic chicken. We decided to delete this sentence because we could not find any information from the Indonesian government and journal saying there is no the standard diet for Arabic chicken. We try to elaborate information from some journals about nutrient requirements for local chicken in the next paragraph in the manuscript.

Line 32 to 33: 'ME and CP' changed to 'metabolizable energy (ME) and crude protein (CP)' (line 35 to 36)

Line 46 to 49: 'In laying hens,.....of high temperature (Daghir, 2008)' was clarify as follow: 'In laying hens, only hens fed with the most concentrated diets were able to meet the recommended daily protein intake at high temperatures when offering diets varying in energy and nutrient density to overcome the nutritional stresses associated with the onset of lay and with periods of high temperature although egg mass output remained low with the highest ME and protein intakes (Daghir, 2008).' (line 49 to 53)

Line 57: 'five-day old'. We decided to make diet adaptation for the chicks during 4 days. An adaptation period may help us to know that the chicks known and ate the diets offered.

Line 81: 'mass' change to 'mash form' (line 92)

Line 86: 'feed through' changed to 'feed offered and feed residues on a weekly basis' (line 95 to 96)

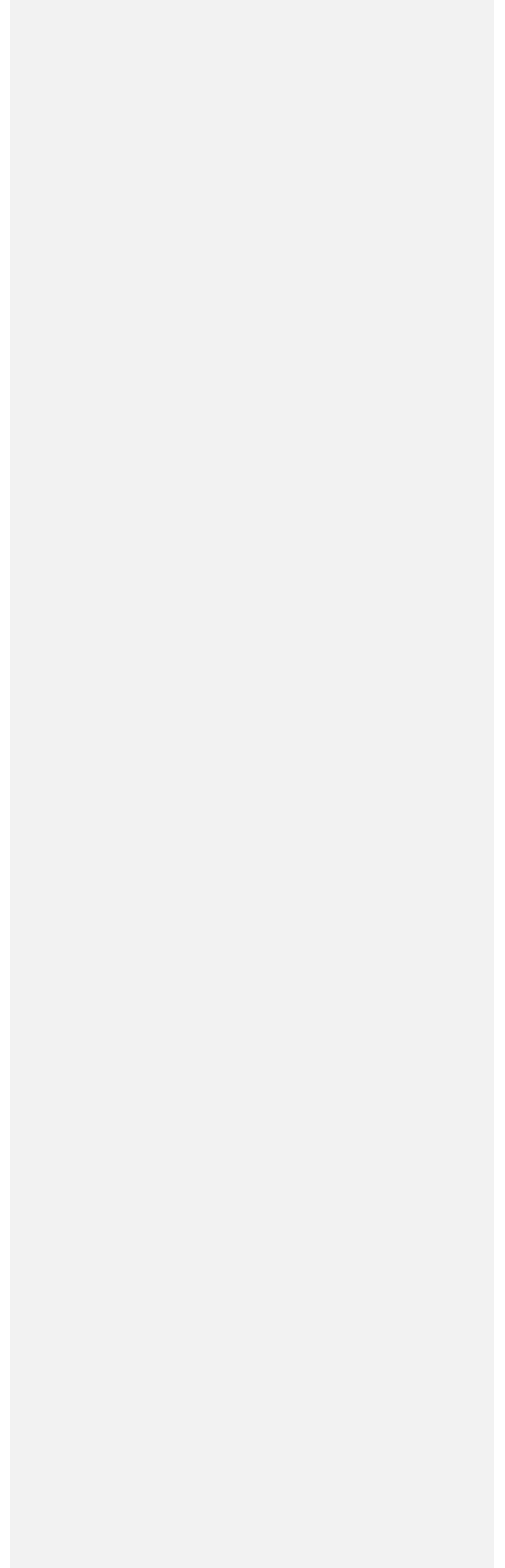
Line 116: 'The results are too long. Please highlight only the most important findings!'

We realized that the results are very long. Since the experiment was conducted to estimate the CP and ME requirements in the starter, grower, developer and pre-laying phases, we analyzed the parameters measured for every phase. Moreover, the data analyzed per week in each phase could also tell us about the dynamic diet self-selection of the chicks.

Line 389: 'Zinc bacitracin'. We use Top Mix as a feed supplement to ensure the adequation of Vitamins and minerals in the diet. However, Zinc bacitracin includes in this product. Therefore, we could not avoid using of zinc bacitracin in the Top Mix.

The inclusion of Top Mix in the diet is 5%/kg and still in the range of usage rules by the Medion company (3 to 5 g/kg). By calculating the amount of zinc bacitracin in the product of

21 mg/kg, so the zinc bacitracin in the diet is 0.0105%. For the future experiment, we will consider not to use AGP.



Date: August 20, 2020

Dear Chief Editor,

We have changed the suggestions about conclusion and adjusted the conclusion statement in the Abstract.

We also added ( $P>0.05$ ) between 'similar' and 'in all periods' (line 16), ( $P<0.05$ ) between 'higher' and 'in choice' (line 17) and ( $P<0.05$ ) between 'higher' and 'in choice' (line 18)

#### **Abstract**

Line 20 to 27: 'Self-selection feeding method gave an opportunity to hens adjusting their ME and CP requirements as indicated by consuming different proportions of each diet offered. Based on BWG, ME and CP requirements of Arabic chicken for the starter and grower periods were similar to the control diet. However, ME and CP requirements for the developer (3091 kcal of ME/kg and 18.5% of CP) and pre-laying (3073 kcal of ME/kg and 18.8% of CP) period were higher than that in the control diet (developer period: 2754 and 16.0; pre-laying period: 2776 and 16.5, kcal ME/kg and % of CP, respectively). The higher ME and CP concentration in the diet consumed during pre-laying period by choice feeding strategy resulted in an earlier onset of lay' were changed to 'It can be concluded that free choice feeding on diet varying in energy and protein had a beneficial effect on growth rate of female Arabic hens by consuming more a high energy-high protein and a high energy-low protein diet. ME and CP requirements for ayam Arab hens during the rearing period were more likely higher than ME and CP contain in the control diet to faster the onset of lay' (Line 20 to 24).

#### **Conclusion**

Line 347 to 354: 'Self-selection feeding method gave an opportunity to hens adjusting their ME and CP requirements as indicated by consuming different proportions of each diet offered. Based on BWG, ME and CP requirements of Arabic chicken for the starter and grower periods were to with the control diet. However, ME and CP requirements for the developer (3091 kcal of ME/kg and 18.5% of CP) and pre-laying (3073 kcal of ME/kg and 18.8% of CP) period were higher than that in the control diet (developer period: 2754 and 16.0; pre-laying period: 2776 and 16.5, kcal ME/kg and % of CP, respectively). The higher ME and CP concentration in the diet consumed during pre-laying period by choice feeding strategy resulted in an earlier onset of lay' were changed to 'Free choice feeding on diet varying in energy and protein had a beneficial effect on growth rate of female Arabic hens by consuming more a high energy-high protein and a high energy-low protein diet. ME and CP requirements for ayam Arab hens during the rearing period were more likely higher than ME and CP contain in the control diet to faster the onset of lay' (Line 344 to 347)



Dear Chief Editor.

We have changed all the suggestions given as the following:

Line 14 to 21: 'Results showed that ME and CP intakes were similar in all periods. However, ME and CP concentrations were higher in choice dietary treatment in all periods, except CP concentration in starter period. BWG started to be higher in choice dietary treatment during developer and pre-laying period. ME and CP requirements for starter and grower periods were similar with the control diet. However, choice dietary treatment resulted in a higher growth rate during developer by 3091 kcal of ME/kg and 18.5% of CP and during pre-laying by 3073 kcal of ME/kg and 18.8% of CP. The onset of lay was two days early in choice-fed birds' **were changed to** 'Results showed that feed intake was significantly lower in choice dietary treatments in all period, except in the starter period. ME and CP intakes were similar in all periods. However, ME and CP concentrations in the diet consumed were higher in choice dietary treatment in all periods, except CP concentration in starter period. BWG started to be higher in choice dietary treatment during developer and pre-laying period. The onset of lay was two days early in choice-fed birds.'

Self-selection feeding method gave an opportunity to hens adjusting their ME and CP requirements as indicated by consuming different proportions of each diet offered. Based on BWG, ME and CP requirements of Arabic chicken for the starter and grower periods were similar to the control diet. However, ME and CP requirements for the developer (3091 kcal of ME/kg and 18.5% of CP) and pre-laying (3073 kcal of ME/kg and 18.8% of CP) period were higher than that in the control diet (developer period: 2754 and 16.0; pre-laying period: 2776 and 16.5, kcal ME/kg and % of CP, respectively). The higher ME and CP concentration in the diet consumed during pre-laying period by choice feeding strategy resulted in an earlier onset of lay'. (Line 14 to 27)

Line 36 to 43: 'Kompiang *et al.* (2001) reported that crude protein (CP) in the diet about 16% with 2900 kcal ME/kg are needed to support the growth of local village chicken from 2 to 22 week. However, there was no information about the sex of chicken used. Hidayat *et al.* (2011) reported that CP in the diet 19 to 22% from starter (0-12 week) to grower (12-22 week) of KUB Chicken (local village chicken selected for egg production) reached the first laying age much faster (145.7 to 151.6 d) than 16% and 17% CP with isocaloric of 2800 kcal ME/kg (160.7 and 161.9 d, respectively). These studies suggested that nutrient requirements of local village chickens are still not conclusive.' **were changed to** 'Kristina Dewi *et al.* (2015) reported that the growth rate and feed conversion ratio (FCR) of native chicken in Bali during the starter phase (0-8 weeks) increased with an increase in dietary energy (3100 kcal ME/kg) and CP (22%). Raphulu and van Rensburg (2018) reported that crude protein (CP) in the diet about 17% with 2627 kcal AME/kg for starter period (0-6 weeks) and 15% with 2866 kcal AME/kg for grower period (7-17 weeks) are needed to optimize the growth rate and FCR for unsex local chicken in South Africa. Perween *et al.* (2016) reported that the backyard breed namely Vanaraja developed by the Project Directorate of Poultry (PDP), Hyderabad that was very well acclimatized to village climate in India have a better body weight gain and FCR with 17% and 19% CP combined with 3000 kcal ME/kg. These studies suggested that nutrient requirements of local village chickens are still not conclusive.' (Line 41 to 51)

Line 342 to 347: 'Self-selection feeding method gave an opportunity to hens adjusting their requirements as indicated by the greater ME and CP concentrations in the diet consumed. ME and CP requirements for starter and grower periods were similar with the control diet. However,

Commented [MP1]: Please add conclusion statement

choice dietary treatment resulted in a higher growth rate during developer by 3091 kcal of ME/kg and 18.5% of CP and during pre-laying by 3073 kcal of ME/kg and 18.8% of CP. The onset of lay was two days early in choice-fed birds' were changed to 'Self-selection feeding method gave an opportunity to hens adjusting their ME and CP requirements as indicated by consuming different proportions of each diet offered. Based on BWG, ME and CP requirements of Arabic chicken for the starter and grower periods were similar to the control diet. However, ME and CP requirements for the developer (3091 kcal of ME/kg and 18.5% of CP) and pre-laying (3073 kcal of ME/kg and 18.8% of CP) period were higher than that in the control diet (developer period: 2754 and 16.0; pre-laying period: 2776 and 16.5, kcal ME/kg and % of CP, respectively). The higher ME and CP concentration in the diet consumed during pre-laying period by choice feeding strategy resulted in an earlier onset of lay. (Line 348 to 355)

Reference: KOMPIANG et al. (2001) and Hidayat et al. (2011) were replaced with Kristina Dewi et al. (2015) (Line 392 to 394), Raphulu and van Rensburg (2018) (Line 417 to 418) and Perween et al. (2016) (Line 409 to 411)

Comments to Chief Editor (16<sup>th</sup> Oct, 2021)

We would like to thank you for your comments and suggestions, and we have revised your comments and suggestions.

**Abstract:** We stated the amount of ME and CP requirements for Ayam Arab hens in abstract (Line 27 to 31): ME and CP requirements of Ayam Arab hens for starter period were 3026 kcal of ME/kg and 18.8%, for grower period were 3081 kcal of ME/kg and 18.4%, for developer period were 3091 kcal of ME/kg and 18.5% and for pre-laying period were 3072 kcal of ME/kg and 18.8% to faster the onset of laying.

**Conclusion:** We stated the amount of ME and CP requirements for Ayam Arab hens in abstract (Line 376 to 379): ME and CP requirements of Ayam Arab hens for starter period were 3026 kcal of ME/kg and 18.8%, for grower period were 3081 kcal of ME/kg and 18.4%, for developer period were 3091 kcal of ME/kg and 18.5% and for pre-laying period were 3072 kcal of ME/kg and 18.8% to faster the onset of laying.

**Table 1:** There are no HEHP, LEHP ... etc in the table.

We have added the superscript 3 to 6 for HEHP, HELP, LEHP AND LELP respectively. (Line 466)

**Table 2:** There are no HEHP, LEHP ... etc in the table

HEHP, LEHP...etc are the type of feeds offered in the self-selection feed group. We wrote the control and self-selection feed here are to keep in main of the readers about our dietary treatments.

**Table 2:** Please add unit for CP and energy utilization in all Tables and Figures

We have added the unit for CP Utilization (g of CP/g BWG) and Energy Utilization (kcal of ME/g BWG) in Tables 2 to 6 and Figures 2 to 5 and 7

**Table 3 to 6:** We changed "Control" to "Control feed" and "Self-Selection" to "Self-Selection feed"

We have changed "parameters" by "variables" in all Tables.

**Table 7:** Please write the complete term of ME and CP level with BWG?

We wrote the title of Table 7 as follow: Correlation between energy (kcal of ME/kg) and protein (g/kg) with body weight gain (g).

Sincerely yours,  
Syafwan

## Participants

Prof. Dr. Komang G Wiryawan (komang)

syafwan (syafwan)

## Messages

Note	From
<p>Syafwan, Noferdiman, S. Zubaida , T. M. Pasaribu, &amp; Adrizal:</p> <p>Your submission "Estimation of Energy and Protein Requirements of Arabic Hens during Rearing Period by Free Choice Feeding" for Tropical Animal Science Journal has been discussed in the Editorial meeting.</p> <p>Submission No. TASJ-30717</p> <p>Please check if there are comments and suggestions from the Editor that the Authors should address. Please also check if there are corrections to the typesetting. Please do the revision in the attached file, give highlights to the correction, and return the document within 7 days.</p> <p>After the copyediting stage, we will send you the PROOF of your manuscript as we will ask you for some correction of the final form of your manuscript.</p> <p>If you are unable to undertake this work at this time or have any questions, please contact me. Thank you for your contribution to this journal.</p> <p>Prof. Dr. Komang G Wiryawan Chief Editor Tropical Animal Science Journal kgwiryawan@yahoo.com</p> <p><a href="#">komang, Copyediting TASJ-30717.docx</a></p>	<p>komang 2021-10-11 11:08 AM</p>
<p>▶ We would like to thank you for your comments and suggestions, and we have revised your comments and</p>	<p>syafwan 2021-10-16</p>

<p>▶ We would like to thank you for your comments and suggestions, and we have revised your comments and suggestions.</p> <p><a href="#">📎 syafwan, Comments to Chief Editor Oct 16th 2021.docx</a></p> <p><a href="#">📎 syafwan, TASJ-30717_Revised by Author 4.docx</a></p>	<p>syafwan 2021-10-16 09:19 PM</p>
<p>Dear Author,</p> <p>Thank you for submitting the Copyediting revision of your manuscript. We will check first the submitting file. After the copyediting stage, we will send you the PROOF of your manuscript, as we will ask you for some correction of the final form of your manuscript.</p> <p>Regards,</p> <p>Prof. Dr. Komang G Wiryawan Chief Editor Tropical Animal Science Journal kgwiryawan@yahoo.com</p>	<p>komang 2021-10-18 10:13 AM</p>

