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Impact of Fresh Azolla Feeding on Egg Production and Production Cost in Local Dohfari-Chicken

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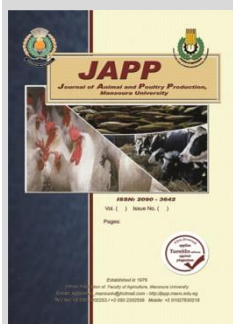


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ABSTRACT

The study examined the impact of fresh Azolla feeding on egg production and production cost in local dohfari chicken. It was conducted from period of Oct 2022 to January 2023 in the animal researches station salalah-oman. In this study, birds were distributed into three group with different feeding levels (A), (B) and (C) respectively, each group consist of 30-layer hen of 5-month old weight average of 1.6 kg. Group(A)fed on 100g of concentrated feed 17%protein per day, group (B)fed on 100g of 50%fresh Azolla and 50% concentrated feed 17%protein and group (C)fed on 100g of fresh Azolla per day. The data of daily egg production was collected and data of production inputs also collected. The study used one was ANOVA test to analyze the data and visibility study to analyze the cost. The results show that there is significant difference in egg production among three groups ($p < 0.001$), that means group (A)which is control group recorded average of 22egg with percentage 73.3%, group(B)recorded average (16.13) egg with percentage of 53.7% and group (C)recorded average of (3.48) egg with percentage 11.6%, and also use of Azolla minimize nutrition cost by 50% and total cost of production by 35% and consider as sustainable and economic feed source.

Keywords: Fresh Azolla; Egg Production; Dohfari Chicken; Production Cost

INTRODUCTION

The shortage of feed is the most important problem that hinder the development of poultry industry all over the world (Nagh-shi et al,2014).The incorporation of conventional feed ingredient like maize,soya bean, fish etc. in poultry feed has cause an enormous increase in the cost of feed, thus any attempt to reduce the cost of feed may lead to significant reduction in the total production cost (swain e al,214).Poultry raiser and farmers are search of sustainable and commercial fed ingredient for poultry feeding.

Poultry industry gotten to be one of the most growing sector within the world because it makes a difference in fulfill the hole between the requirement and accessibility of high quality protein for human utilization, driving to extend request for higher and more secure protein source (Alkhalf et al,2010).

Azolla might be a small aquatic greenery (Mohamed et al,2018), which streams on the water surface and has capacity to create viably inside the tropic and sub- tropic with least speculation cost, since it creates really in stagnant water of conduit, canal, lakes (Debashis e al, 2016). Azolla can intentioned have in new water with powerful of speed creating to twofold of biomass inside two or three days. In addition, Azolla is one of the locally open aquatic pteridophyte which is wealthy in protein and about all fundamental amino acids (Alalade and lyayi, 2006 and mandal et al,

Objectives:

Main objective to find out the effect of Azolla feeding on egg production in local dohfari chicken

Other objectives;

- 1- To study the different level of fresh Azolla in poultry ration
2. To find out economic benefits of Azolla

MATERIALS AND METHODS

Area of study:

Livestock Researches Station –Salalah-Dohfar- Oman

Material:

- 1) 3 Trenches 2.5m*1.5m*0.2m
- 2) 3 Poly sheet 3m*2m
- 3) Cow dung 15kg
- 4) Azolla culture
- 5) Poly net
- 6)Water source
- 7) 3 Poultry pen
- 8) 150 Lying dohfari chicken
- 9) Poultry ration concentrate feed with 17% protein
- 10) Fresh Azolla.

Method:

- Azolla were established to produce Azolla for poultry feeding during research
- 90 dohfari chicken were distributed into three group as follow: group A control was fed in normal poultry layer ration 17% protein, group B was fed with 50% fresh Azolla and 50%normal poultry fed17% protein, and group C was fed with 100% fresh Azolla.

Data collection:

- Daily egg production for each group was recorded for the period of study 3 month.
- Cost of production and economic efficiency was recorded.

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Data analysis:

- Statistical analysis all the recorded and calculated data was analyzed by ANOVA one-way test analysis and visibility study.

RESULTS AND DISCUSSION

Egg production

The impact of fresh Azolla feeding on daily egg production is shown in Table (1).

Table 1. Egg production

Diet content and egg production			
No.	Group(Total number 30)	Diet 100g/ per day	Egg production
1	A	Concentrated feed (17% protein)	22 (73.3)
2	B	50% fresh Azolla and 50% concentrated feed (17% protein)	16.13 (53.7)
3	C	Fresh Azolla	3.48 (11.6)

Table 2. Feed Conversion Ratio(FCR):

NO	Group	Amount Of Diet Consumed(g)	Egg mass Produced= egg number produced /average of egg weight (g)	Feed Conversion Ratio= amount of diet consumed(g)/ egg mass(g) produced	FCR
1	A	270000	1941*45(g)=87.345	270000/87.345	3.09
2	B	270000	1407*47(g)=66.129	270000/66.129	4.08
3	C	270000	307*45(g)=13.815	270000/13.815	19.5

Production cost

The production cost for Azolla and concentrate feed is shown in Table (*).

Table 3. Production cost

Azolla cost				Concentrate feed 17%protein cost			
Fixed cost in OR				Fixed cost in OR			
Items	Quantity	Price	Total	Item	Quantity	Price	Total
Azolla trenches	3	50	150				
Poly sheet	3	=	50				
Poly net	3	10	30				
Metal skeleton							
total		250		total			
Operation cost in OR				Operation cost in OR			
Items	Price	Quantity	Total	Items	Price	Quantity	Total
Azolla culture	2	3kg	6				
Fertile soil	3	45	9				
Cow dung	0.05	30kg	1.5				
Total		15.5		Total			
Total cost.		265.5 OR(Omani Rial)		Total cost		270 OR(Omani Rial)	

(OR: Omani Rail Omani currency)

Economic efficiency parameter for egg production:

The economic efficiency parameter in Table (4) variation in feed intake cost between groups of study which is (1.8 RO) for group (A) control group's highest cost then group (B) showed (1.125 RO) and group (c) showed (0.45 RO) in the term of the total cost(TC), total fixed cost(TFC) and total return(TR) group (A) has high (TC, TFC, and TR) and economic efficiency (EE) is (0.26), while for the group (B) has high economic efficiency (15.5) and moderate level (TC, TFC, and TR) for the group (c) has moderate economic efficiency (13) and low level (TFC, TR, and moderate TC)

The total production cost for 1500kg of Azolla is 265.5 OR, when compare with concentrate feed that bought direct form market is 270 OR. The difference appears when to compare the operation cost for Azolla for one-year production is 15.5 OR to produce 1500kg he we achieve sustainable source.

The visibility study for production of Azolla shows that the Azolla could minimize production cost for nutrition by 50%, and also shows that production cost for Azolla is low when compare to concentrated feed and sustainable with time factor.

Group (A) which consumed control diet (100g of concentrated feed 17% protein per day) had recorded average of egg production 22 egg with percentage (73.3%), group (B) which consumed 100g of 50% fresh Azolla and 50% concentrated feed 17% protein had recorded average of 16.13 egg with percentage (53.7%) and group (C) which consumed 100g of fresh Azolla per day had recorded average of 3.48 egg with percentage (11.6%).

Feed Conversion Ratio(FCR):

The feed conversion ratio for egg production shown in Table (2) is calculated by dividing the amount of diet consumed during the study over the egg mass produced for each group as follows for group (A) recorded lowest (FCR) 3.09 and group (B) recorded 4.08 (FCR) while group (C) recorded high (FCR) which is 19.5

During the study the groups consumption of feed from Azolla and concentrate feed was 3 to 1500kg from Azolla and 1500kg from concentrate feed.

Table 4. Economic efficiency parameters for egg production

parameter	Experimental group		
	Control group (A)	Group (B)	Group (C)
Cost parameter			
TFI cost (\$/hen)	1.8	1.125	0.45
TFC(\$/hen)	3	1.5	2.9
TC(\$/hen)	4.8	2.62	3.35
Return parameters			
Eggs selling (\$/hen)	3.25	2.55	0.53
Litter selling (\$/hen)	0.031	0.031	0.031
Chicken selling (\$/hen)	2.5	2.5	2.5
TR (\$/hen)	5.781	5.081	3.06
NR (\$/hen)	0.98	2.431	-0.29
Feed cost / kg gain (\$/kg gain)	2.4	0.26	0.20
NR / kg gain (\$/kg gain)	1.3	4.5	2.6
Economic efficiency	0.26	15.5	13

TFI cost: Total feed intake cost; TFC: Total fixed cost; TC (Total cost); TR: Total return; NR: Net return

Fresh green feeds have been reported to add succulence to feed, stimulate appetite, supply protein,

minerals and vitamins, and could contribute significantly to improved performance of birds (Oluyemi and Roberts 1988). Azolla is of intrigued as a protein feed due to the high protein substance of its biomass, which was detailed to be between 20–40% of the dry weight (Kumar and Chander 2017). Many studies revealed that Azolla pinnata meal has long been used successfully for broiler and layer chickens (Alalade and Iyayi 2006; Balaji et al. 2009; Dhumal et al. 2009).

The impact of nourishing Azolla pinnata on layers' diet on feed intake, egg laying execution and quality characteristics has not been completely examined and relevant information for poultry is missing. This study indicates the high rate of intake in Azolla consumption for group (C) which depend on Azolla in their feed, this result of fully consumption of prescribed amount of daily feed, it was 3kg for whole group. This finding was supported by Querubin et al (1986) who observed a significant difference in the feed intake when Azolla increased up to 15% in the diet.

In differentiate, (Seid 2003) shows that the dietary incorporation of Azolla feast did not influence the every day bolster admissions and body weight picks up of layers. Comparative result was gotten by Shamna et al (2013), who did not discover noteworthy contrasts in nourish admissions in quails on ordinary apportion from the quails on proportion supplemented with 5% Azolla, as they utilized sun dried Azolla powder inside the proportion.

The obtained results showed low egg production in group (C) which consumed 100g of fresh Azolla per day, but the group maintain good health and body condition, the present investigations revealed that Azolla is lacked of energy content that important for egg production.

Group (B) which consumed 50% Azolla and 50% concentrate feed showed that egg production at average of 16.13 egg with percentage (53.7%), and also maintain good health and body condition.

In group (A) which is control group and consumed control diet (100g of concentrated feed 17% protein per day) has a highest average of egg production 22 egg with percentage (73%) of total egg production.

Bidya et al (2018) found that the hen housed egg generation amid the trial uncovered that the cruel egg generation of Azolla fed bunch (53.2) was essentially higher than the control bunch (47.0) as well as concentrate fed bunch (49.9).

fresh Azolla is good feed supplement for reducing cost and high advantage cost production non backyard poultry (Bidya et al., 2018). Usually 100g per bird per day may be nourished for superior body weight as well as more number of egg production.

(Lakshmanan and Katha 2017) found that the layer birds fed with Azolla hybrid ring ping increased egg yield due to Azolla feeding, and Azolla fed bird registered an overall egg productivity of 89% as against 83.7% recorded by bird fed with only concentrate feed.

(O. AOUEDI et al 2022) found that, in layers, the utilize of Azolla moves forward efficiency in term of egg amount and quality as Azolla contain pigments, minerals and fundamental amino acids

Poonam et al 2020) found that the total egg production was significantly high in gr(III) which is Azolla fed group compared to gr(II) and gr(I) on 54 weeks and 70 week of age on an average 203 egg have been produced by layer from

gr(III) up to 70 week of age. The high growth rate, egg weight and egg production were moreover detailed by specialists which may be due to high protein substance of Azolla which meet the major necessities of the body.

Feed speak to the major cost of poultry production, constituting up to 70% percent of the full of feed taken a toll, around 95% percent is utilized to meet vitality and protein prerequisites, around 3 to 4 percent for major minerals, take after minerals and vitamins prerequisites, and 1 to 2 percent for diverse feed included substances (Velmurugu Ravindran , 2013)

Feed cost/kg and add up to feed cost/hen significantly reduced with expanding levels of Azolla meal in the diets. Many considers showed up that the utilization of Azolla in layers' diets spared the concentrate feed taken a toll (Khatun et al 2008; Lakshmanan et al 2017; Wasihun et al 2020). Azolla makes the differentiate and ought to do with lower feed costs.

The results of this study indicated that the Azolla could minimize production cost for nutrition by 50%, and the production cost for Azolla was low when compare to concentrated feed. This is in agreement with the findings given by (Lejeunea et al., 1999; Alalade and Lyayi, 2006; Namra et al., 2010).

CONCLUSION

Azolla has low energy content result in low egg production.

Azolla mixed with concentrate feed is recommended for low and medium scale producers because its lowering nutrition cost at level of 50%, while lowering the egg production at level of 20%.

Azolla could be economically useful by minimize production cost.

We recommend More studies about Azolla benefits.

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أثر التغذية بالأزولا الطازجة على إنتاج البيض وتكاليف الإنتاج في الدواجن المحلية الظفارية

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الملخص

تناولت هذه الدراسة التعرف على أثر التغذية بالأزولا الطازجة على إنتاج البيض وتكاليف الإنتاج في الدواجن الظفارية. وقد جرت التجربة في محطة البحوث الحيوانية صلالة في الفترة من نوفمبر ٢٠٢٢م إلى يناير ٢٠٢٣م. وقد قسمت الدراسة إلى ثلاث مجموعات بمستويات تغذية مختلفة مجموعة أ ومجموعة ب ومجموعة ج. كل مجموعة كانت تحوي ٣٠ دجاجة بياضه عمر خمسة أشهر بمتوسط وزن ١٦٠٠ غ. تغذت المجموعة أ على ١٠٠ غ من العلف المركز ١٧٪ بروتين في اليوم والمجموعة ب تغذت على ٥٠ غرام أزولا و ٥٠ غرام علف مركز والمجموعة ج تغذت على ١٠٠ غرام أزولا طازجة. تم جمع بيانات إنتاج البيض اليومي للمجموعات الثلاث وبيانات تكاليف مدخلات الإنتاج. استخدمت الدراسة اختبار انوفا ذو الاتجاه الواحد ودراسة الجوى في التحليل وقد ابرزت النتائج وجود فروق معنوية في المجموعات الثلاث في إنتاج البيض وقد سجلت المجموعة أ وهي مجموعة الحكم متوسط ٢٢ بيضة بنسبة ٧٢٪ والمجموعة ب متوسط ١٦ بيضة بنسبة ٥٣٪ والمجموعة ج سجلت متوسط ٣٠ بيضة بنسبة ١١.٦٪. أوضحت النتائج أن استخدام الأزولا يقلل من تكلفة التغذية بمعدل ٥٠٪ يعني التقليل من التكلفة الكلية للإنتاج بمعدل ٣٥٪ وأيضاً الأزولا مصدر اقتصادي مستديم.