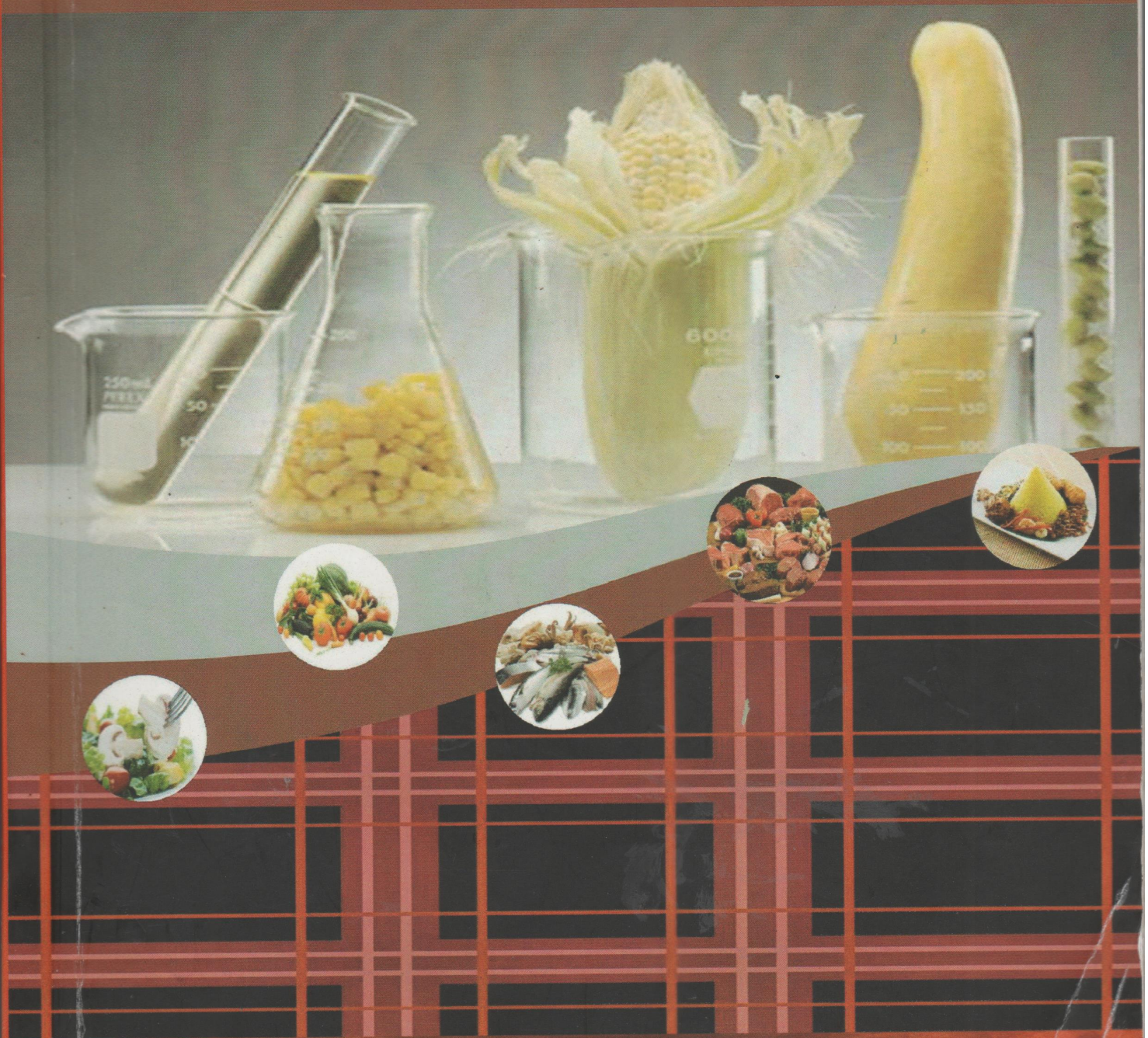


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PROCEEDING

INTERNATIONAL CONFERENCE ON
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Preface

The greatest regards should be expressed only to God the Almighty, Allah SWT. We have finished the Proceeding of The 1st International Conference on Food, Agriculture and Culinary Tourism (ICFACT) in six months after the conference which was held on 4-6 August 2015. This conference is in coherence with a grand agenda of increasing national and local food security and also improving nutritional statuses of the people. The conference focused on food, agricultural products and culinary that support food security, safety, processing advancement and their aesthetical aspects.

This conference proceeding volume contains the written version of most of the contributions presented during the conference, as oral and poster presentation. During the conference there were 6 keynote speakers, 37 oral presenters and 15 poster presenters who gave their speech, presentations and posters of their recent research. This conference presented international speakers from Chulalongkorn University, Associate Professor Saiwarun Chaiwanichsiri, University Putera Malaysia, Associate Professor Azmawani AbdRahman, and a leading presenter, Prof. Dr. Dato Othman Yatim from University Brunei Darussalam. Also, this conference featured fellow professors and scientists from UMS, IPB, LIPI, Balitbang Pertanian, Unpad, Manado, Papua, Mataram, Denpasar, Samarinda, and other places.

All papers presented in this proceeding have been through a series of reviewing process by the Editorial Team. Some paper presented in ICFACT will be published as a special edition of a Scopus Indexed Journal and will be processed through a more in-depth scientific review.

We would like to thanks and appreciate all authors, The Samarinda city government, Food Security and Agricultural Executive Counseling Board of Samarinda, PT Pupuk Kaltim, Food Review Indonesia, and Kulinologi Indonesia, The Editorial Team, The Proceeding Team, The Head of IAFT Chapter Kaltim, and the entire committee member who have been contributed in ICFACT and the proceeding publication.

See you in the next ICFACT at Bumi Etam.

Samarinda, February 2016

Editor

Welcome Speech

Welcome Speech from The ICFACT 2015 Committee

Assalamu'alaikum Warrahmatullahi Wabarakatuh,
A very good morning to you,

Welcome to Samarinda. I, would like to express greatest regard to the Almighty God, Allahu SWT, and also to extend my warmest gratitude to all the audiences, that assist, help, and support this event.

In the light of strengthening Indonesia through development of proficient and professional human resources, food is a major factor transforming to more productive society. This conference is in coherence with a grand agenda of increasing national and local food security and also improving nutritional statuses of the people. Hitherto, the conference will be focussed on food, agricultural products and culinary that support food security, safety, processing advancement and their aesthetical aspects.

We would like to report that about seventy national and international participants are attending the conference. This number is frankly beyond our expectation when we were arranging this at the first time. This suggests Samarinda is attractive and therefore has a potential to be developed as a tourist destination city in Kalimantan. We understand, to access Samarinda requires more effort. In near future, travelling to Samarinda will be less complicated as the new airport is ready to operate.

This conference will present international speakers from Chulalongkorn University, Associate Professor Saiwarun Chaiwanichsiri, University Putera Malaysia, Associate Professor Azmawani AbdRahman, and a leading presenter, Prof. Dr. Dato Othman Yatim from University Brunei Darussalam. Also, this conference will feature fellow professors and scientists from UMS, IPB, LIPI, BATAN, UGM, Widya Mandala, Gorontalo, Papua, Hasanuddin, Mataram, Jember, and other places.

The morning session is designed for keynote speeches and the afternoon session is for parallel sessions. In this regard, the conference will be sectioned in four: (1) food safety as an important factor to food security, (2) functional food development, (3) development of new food products, and (4) natural food production.

The Indonesian Association of Food Technologists chapter East Kalimantan Timur, as an organisation, would like to thank The Samarinda city government, Food Security and Agricultural Executive Counseling Board of Samarinda, PT Pupuk Kaltim, Food Review Indonesia, and Kulinologi Indonesia for their strong support to this conference.

We hope that you will enjoy the tropical climate of East Kalimantan while staying in Samarinda. Without further due, we kindly ask the Rector of Mulawarman University and the Mayor of Samarinda to give speech and also to open this conference, officially.

Wassalamu'alaikum Warahmatullahi Wabarakatuh,

The ICFACT 2015 Committee,

Anton Rahmadi
Chairman.

Welcome Speech**The Head of Food Security and Agricultural Executive Counseling Board of Samarinda**

The honorary, the Mayor of Samarinda city,
Honorary Head of working units of Samarinda
Honorary Rector of Mulawarman University,
Honorary Professors, Academicians, Participants, Invited guests from Indonesia and neighboring countries,
And all the audience.

A very good morning,

In this morning, I would like to thank God for His guidance and blessing. I am also would like to extend my gratitude to my fellow staffs in Food Security and Agricultural Executive Counseling Board of the Samarinda City and our colleagues from all over Indonesia and neighboring countries to attend the first international conference on food, agriculture, and culinary tourism, here in Samarinda, East Kalimantan.

To develop food security is a joint responsibility of government, private sectors, and more importantly the people, themselves. The food security is a condition where sufficient food is provided to a country and individuals. This is reflected by adequate supply of staple food, both in quantity and quality, its safety, diversity, nutritional contents that are accessible and affordable to people. It is also equally important that the provided food supports all religions, believes, and cultures, so that it will produce healthy, active, and subsequently productive society.

The Food Security and Agricultural Executive Counseling Board of Samarinda has responsibility to actively support and assist the successfulness of the program of the Mayor of Samarinda, specifically in the field of food security and agricultural counseling.

The government established Food Security Council in Samarinda with the Mayor regulation number 21, year of 2002. To work towards food security in Samarinda, as an implementation of article 10 of Presidential decree number 18, year of 2006, about the Food Security Council, the function of Food Security Council is further expanded and aligned with the current development.

One highlighted activity of the food security council and agricultural executive counseling board is the International Conference on Food, Agriculture, and Culinary Tourism. This activity is held with an aim to disseminate information and to gather ideas of food security and nutrition practices in ASEAN and Indonesia for further Samarinda development.

Achieving food security and nutrition status is mandated by the Law number 18, year of 2013 and the presidential decree number 17, year of 2015. Of equal importance, it is a necessity to increase quality and quantity of public services to achieve minimum essential standard services as mandated by the Ministry of Agriculture regulation number 65/OT1040/12/2010, and the Interior Minister circular number 100/1023/SJ/2013 dated on 26 of March, 2012 about the acceleration of minimum essential standard services implementation in local governments.

Minimum essential standard services of food security in Samarinda city have achieved above 90 percent in four basic services and seven target indicators in 2015. To illustrate, the people consumption of energy is 1719.8 kilo calories per capita per day. This, however, is below the average daily intake of

2200 calories, as indicated by Widya Karya Pangan dan Gizi, year of 2004 and 2013. On the other hand, the protein consumption is above the national average, achieving fifty-two point four gram per capita per day. The general achievement for food pattern expectation is 81.9 points. In response to reduction of food insecurity region, the case of malnutrition is successfully reduce to less than 0.5 %. It is also noted that food reserves are increased in Samarinda.

This excellent moment of International Conference on Food, Agriculture, and Culinary Tourism is achieved as an excellent collaboration of the Food Security and Agricultural Executive Counseling Board of Samarinda with the Indonesian Association of Food Technologists chapter East Kalimantan, the Department of Agricultural Products Technology, Mulawarman University. We hope that this will produce a fruitful outcome to collect ideas and practices in developing food security and nutrition in Samarinda.

I, with all due respect to the Mayor of Samarinda, would like to ask Bapak Syaharie Jaang to officially open this conference.

Samarinda, 5 August 2015,

Food Security and Agricultural Executive Counseling Board of Samarinda,

Ary Yasir Pilipus

**Welcome Speech
The Mayor of The Samarinda City**

The honorary Head of National Food Security Council,
All the head of working units, SKPD, in Samarinda,
All professors, participants, and colleagues from foreign countries and Indonesia,
And other invited guests.

Assalamu'alaikum Wr. Wb.

A very good morning and welcome to Samarinda, especially for those who are first time to arrive in Samarinda. We wish you to have a pleasant stay and a good impression of this city.

Samarinda faces rapid development in recent years. This includes upgrading and extending city infrastructures. To further develop the city, it is indispensable to have excellent quality of human resources as programmed already in the development plan of the city.

To talk about food, it is a primary need of every person and its fulfillment is an important part of human rights that is guaranteed by our constitution, UUD 1945. Quality food is a prerequisite to produce highly proficient human resources.

The Samarinda city, that covers 718 kilometer square and is populated by nearly one million people, requires adequate supply of foods. In this regard, the government and the people of Samarinda have a role to maintain stability of food supply. The potential agricultural field is less than ten percent, so Samarinda has to emphasize on its strengths that are services and industrial sectors.

Along with the growth of the population and the economy, the demand for food has also increased from time to time. Therefore, the availability and distribution of foods should be underlined as one priority. The agricultural development, regardless currently having a small contribution, should be further developed to not only in the production capacity but also the distribution and marketability. These require a good collaboration with market players, whether they play direct or indirect role to the availability and stability of food supply.

To assist food security in Samarinda, the government established Food Security Council in Samarinda with the Mayor regulation number 21, year of 2002. Further, as mandated by the article 26 of the Presidential decree number 83, year of 2006 about the Food Security Council, the function of Food Security Council is further expanded and aligned with the current development.

As mandated by the article 47 of Law number 18, year of 2013, paragraph 3, the central government along with local governments are responsible for distribution of foods in their authorities. This is also in conjunction with increasing public services to achieve minimum essential standard services as mandated by the Ministry of Agriculture regulation number 65/OT1040/12/2010, and the Interior Minister circular number 100/1023/SJ/2013, dated on 26 of March, 2012 about the acceleration of minimum essential standard services implementation in local governments.

The achievement of minimum essential standard services of food in Samarinda city includes four basic services and seven target indicators with minimum achievement of 90 percent in 2015. As an illustration, energy consumption for people of Samarinda is 1719.8 kilo calories per capita per day. This is below the average daily intake, as indicated by Widya Karya Pangan dan Gizi, year of 2004 and

2013, that stated 2200 kilo calories. The protein consumption is 52.4 gram, is above the national average. The general achievement for food pattern expectation is 81.9 points.

As a follow up to further develop services to people of Samarinda, according to Law number 32, year of 2004 about the local government, it is mentioned that food security is an essential and obligatory service provided by the provincial and city or municipal governments, mainly due to the fact that food security is basic right along with access to living necessities.

The food security, at the end, is not only in production, but is also affected by quality of human resources in the production, distribution, and services, as mentioned in the Law number 18, year of 2012. The production system upgrade is relentlessly achieved by implementing technology and innovation, with the assistance of all related working units, SKPD. This is quint essential to suffice food security status in Samarinda.

This also highlights the importance of the International Conference on Food, Agriculture, and Culinary Tourism that is jointly carried out by the Indonesian Association of Food Technologists chapter East Kalimantan, the Department of Agricultural Products Technology, Mulawarman University, and Food Security Council of Samarinda. It is expected that the conference will produce ideas and a lot of inputs to further develop food security status in Samarinda and Indonesia.

I, the Mayor of Samarinda city, in the name of the Almighty God, and with high appreciation, officially open the International Conference on Food, Agriculture, and Culinary Tourism, 2015.

Wassalamualaikum Wr Wb.

Samarinda, 5 August 2015
The Mayor of the Samarinda city

Syaharie Jaang

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Egg Quality Parameters of Laying Hens Fed Dried Tomato Meal in Diet

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Abstract

In an experiment with one hundred MB 402 laying hens (36 weeks of age), the effect of dried tomato meal in diet on egg quality was determined. The birds were allocated into five experimental diets and each was divided into four replicate groups of five birds per replicate. The control diet (based diet) was formulated to contain 51% corn, 14% rice bran, 7% fish meal, 6% CaCO₃, and 22% commercial diet. Tomato meal was included in four experimental diets at levels of 2, 4, 6, 8% to substitute based diet. The treatments were: R0 = 100% based diet (BD) + 0% tomato meal (TM); R1 = 98% BD + 2% TM; R2 = 96% BD + 4% TM; R3 = 94% BD + 6% TM; and R4 = 92% BD + 8% TM. Chemical composition of tomato meal were: 16.73% crude protein, 1.53% fat, 30.94% crude fiber, 0.98% Ca, 1.20% P, and 2416 Kcal/kg ME. Feed and water were provided for *ad libitum*. The study was conducted over a period of 8 weeks. Data were collected on eggs quality: egg weight, egg shell weight, egg shell thickness, egg yolk weight and egg albumin weight. Data were analyzed by one-way analysis of variance (ANOVA). The treatment means were compared using Duncan's multiple range test. The results showed that no differences in hen egg weight, egg shell weight and egg shell thickness between treatments R1, R2, R3, and R4 compared to treatment R0 (control). It can be concluded that tomato meal can be used as an alternative feedstuff in laying hen diets at inclusion levels up to 8% without negative effects on egg quality.

Keywords: Dried tomato meal, egg quality, laying hens

Introduction

The information on the structure of egg are essential for an understanding of egg quality of the poultry. Age, feed, protein levels and temperature are some of the factors that affect egg size in chickens (Banerjee, 1992). Egg quality traits such as weight, size, yolk and albumen contents are quantitative traits with continuous variability (Das, 1994). Selection for egg quality was used mainly to avoid any negative shift in eggshell quality or internal defect. The relationship between weight, length and width of eggs has been reported by Danilov (2000) who also noted the proportion of yolk, albumen and shell that contribute to the egg weight. Thus egg weight is one of the important phenotypic traits which influence egg quality of the chicken parents (Islam, *et al.*, 2001).

Egg shell quality is a vital factor in poultry production as large number of eggs with defective shell lead to great economic losses (Lavelin, *et al.*, 2000). The external and internal quality of eggs is influenced by a broad range of factors. This is because egg quality criteria includes such diverse and important aspects as safety, nutritional and organoleptic properties or technological properties for cooking. Nutrition is important for controlling eggshell quality and can successfully enrich the egg in some minor components of interest for human nutrition.

As Roland, *et al.* (1996) reported, that calcium deficiency lead to decreased egg production, egg weight, egg specific gravity, feed consumption and bone density and strength. While excess calcium significantly reduced egg production, egg weight, and feed consumption (Harms and Waldroup, 1971). Wistedt (2013) reported that egg shell mainly composed by calcium that indicate calcium will play important role affecting egg shell weight.

Tomato are excellent sources of potassium, folate, and vitamins A, C, and E, but are superior sources of α -tocopherol and vitamin C. Fiber is another dietary component and appreciable amounts are found in tomato. Tomatoes also contains a variety of phytochemicals, including carotenoids and polyphenols (Campbell, *et al.*, 2004). The nutritional value of tomato can provide the poultry industry with an alternative feedstuff.

Squires, *et al.* (1992) reported that tomato pomace could be used in broiler chicken diets up to level of 20 %. That using of dried tomato pomace (only separated tomato seeds) in broiler chicken diets were caused an extended shelf life for broiler meats, because of alpha-, beta-, gamma- and delta-tocopherols in tomato pomace cause an antioxidant effect. Dried tomato pomace was fed to laying hens at an inclusion rate of 12%, which resulted in similar egg production, feed efficiency, egg weight and shell. Dried tomato pomace contains 10%

moisture, 20.77% crude protein, 1760 Kcal/kg ME, 39.8% crude fiber, 7.3% ether extract, 4.24% ash, 0.5% calcium and 0.45% phosphorus (Jafari, *et al.*, 2006). The limiting factors of dried tomato pomace in poultry diets are low energy and high fiber contents (Squires, *et al.*, 1992). The tomato seed protein is rich in lysine (approximately 13% more lysine than soya protein) and can supplement feed that is deficient in lysine (Latlief and Knorr, 1983). The objective of this research was to evaluate the use of dried tomato meal in diet to egg quality of laying hens.

Materials and Methods

The tomatoes were washed, cut, and sun-dried to constant weight for 3-5 days. Part of tomato then was ground to fine powder using mortar and pestle. After that, mixed with other ingredients to compound the feed.

One hundred MB 402 laying hens (36 weeks of age) were used for the study. The birds were divided into five experimental diets and each was divided into four replicate groups of five birds per replicate using completely randomized design. The control diet (based diet) was formulated to contain 51% corn, 14% rice bran, 7% fish meal, 6% CaCO₃, and 22% commercial diet. Tomato meal was included in four experimental diets at levels of 2, 4, 6, 8% to substitute based diet. The treatments were: R0 = 100% based diet (BD) + 0% tomato meal (TM); R1 = 98% BD + 2% TM; R2 = 96% BD + 4% TM; R3

= 94% BD + 6% TM; and R4 = 92% BD + 8% TM. Chemical composition of tomato meal were: 20.73% crude protein, 1.53% fat, 30.94% crude fiber, 0.98% Ca, 1.20% P, and 2416 Kcal/kg ME, and chemical composition of the diets are shown in Table 1.

Feed and water were provided for *ad libitum*. Eggs were collected two times a day. The study was conducted over a period of 8 weeks. Data were collected on egg weight, eggshell weight, eggshell thickness, egg yolk weight and egg albumin weight. Egg weight, egg shell weight, and egg shell thickness were determined for eggs collected during the last 3 days of each period. Egg shell weight and yolk and albumin weight were calculated by formula:

1. Egg shell weight (g/egg) is measured by broken down the eggs, then egg shell separated from albumen and yolk. Egg shell is cleaned from the rest of albumen and then weighed (An, *et al.*, 2010).
2. Yolk weight (g/egg) is measured by separate yolk from albumen then weighed (An, *et al.*, 2010).
3. Albumen weight (g/egg) is calculated by egg weight minus by egg shell weight and yolk weight (An, *et al.*, 2010).

Data collected were subjected to analysis of variance (ANOVA). Where significant variance ratios were detected, differences between treatment means were tested using Duncan's multiple range test procedures (Snedecor and Cochran, 1967).

Table 1. Chemical Composition of the Diets

Nutrients	Diets				
	R0	R1	R2	R3	R4
Crude protein (%)	17.49	17.47	17.45	17.44	17.42
Fat (%)	6.63	6.61	6.59	6.57	6.56
Crude fiber (%)	4.31	5.41	6.50	7.24	8.69
Ca (%)	2.76	2.75	2.69	2.66	2.56
P (%)	1.42	1.16	1.42	1.41	1.40
ME (Kcal/kg)	2766	2759	2752	2745	2738

Results and Discussion

The effects of dietary dried tomato meal on the egg quality of laying hens during the entire trial period are shown in Table 2. Results showed that no

differences in hen egg weight, egg shell weight and egg shell thickness, egg yolk weight and egg albumin weight between treatments R1, R2, R3, and R4 compared to treatment R0 (control).

Table 2. Effect of Dried Tomato Meal in Diet on Egg Quality

Variable	Treatments				
	R0	R1	R2	R3	R4
Egg Weight (g/egg)	60.50 ± 0.80 ^a	60.00 ± 1.07 ^a	61.48 ± 2.84 ^a	60.01 ± 1.73 ^a	60.42 ± 0.47 ^a
Yolk Weight (g/egg)	14.77 ± 0.66 ^a	14.69 ± 0.54 ^a	15.66 ± 0.60 ^a	15.06 ± 0.45 ^a	14.89 ± 0.54 ^a
Albumen Weight (g/egg)	35.94 ± 1.84 ^a	35.84 ± 1.46 ^a	34.42 ± 2.48 ^a	35.29 ± 1.84 ^a	36.83 ± 1.6 ^a
Egg Shell Weight (g)	5.98 ± 0.27 ^a	5.97 ± 0.04 ^a	6.09 ± 0.19 ^a	6.06 ± 0.18 ^a	5.99 ± 0.09 ^a
Egg Shell Thickness (mm)	0.39 ± 0.01 ^a	0.37 ± 0.01 ^a	0.38 ± 0.00 ^a	0.37 ± 0.00 ^a	0.36 ± 0.00 ^a

Notes: Various characters within each class indicate the presence of significant differences at the level of probability ($p < 0.05$).

Yannakopoulos, *et al.* (1991) reported that body weight gain, egg number, feed consumption and mortality of laying hens were not significantly affected by 150 g kg⁻¹ tomato meal. But, mean egg weight tended to be increased by tomato meal. Egg shell quality and egg shape index were not significantly affected by the diets. So, tomato meal could be used for laying hens for improving egg quality. That egg shell weight and egg shell thickness in this experiment were not affected by the increasing level of dried tomato meal are in agreement with Bordowski and Geisman (1980), Yannakopoulos, *et al.* (1992) and Dotas, *et al.* (1999), and that could be due to the similar calcium and phosphorus contents in all treatments diets. Egg shell mainly composed of calcium carbonate, and some of trace minerals such as magnesium (Leeson and Summer, 2005). Calcium plays important role in affecting egg shell weight. Ahmad (2013) also reported that supplementation of canola oil (omega-3 PUFA sources) and vitamin A (antioxidant sources) to laying hen feed did not give significant effect on egg shell weight and egg shell thickness. Vasupen, *et al.* (2013) and Mansoori *et al.* (2008) reported that feeding laying hens diets containing tomato pomace at inclusion 10% did not affect egg production, egg weight, feed consumption and efficiency of the hens.

Yolk synthesis was complex mechanisms that involve nutrient metabolism and physiological function. Anton (2007) found that lipids contribute to about 65% of dry matter content of egg yolk, which indicated lipid/fat consumption was the most important thing affected yolk weight. Supplementation of 3000 ppm fish oil + 150 ppm tomato powder in feed give best result on yolk weight and albumen weight of local duck (Andri, *et al.* 2015). It may be due to the presence of tomato powder that provide vitamin C and E which can act as antioxidant to prevent oxidative stress caused by fish oil, which indicated that tomato powder could be potential as antioxidant to support fish oil to increase egg quality.

Leke, *et al.* (2015) in previous study reported that the obtained of whole egg nutrients results indicated that the tomato diet up to 8% have similar quality to based diet, so, that could have beneficial nutritional impact for laying hens. These suggest that the use of tomato meal in laying hen diets might have positive effects on whole egg quality. So, it is a possible alternative for satisfying consumers' preferences about egg quality.

Conclusion

These finding indicated that dried tomato meal could be used as an alternative feedstuff in laying hen diets to substitute based diet, at inclusion levels up to 8% without negative effects on egg quality.

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CERTIFICATE of RECOGNITION

This is to certify that

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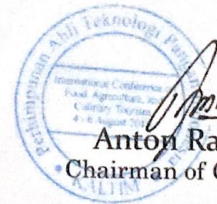
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Ary Yasir Pilipus
Head of Food Security Bureau
Samarinda



Anton Rahmadi
Chairman of Conference

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