



Empowerment of Mojogedang Layer Farm Partners in Utilizing Aloe Vera as a Coating to Extend the Shelf Life of Broiler Eggs

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Abstract: Aloe vera gel can be used as an edible coating for chicken eggs, providing a natural alternative to chemical preservatives. This activity aimed to empower community members to utilize aloe vera gel as a coating for poultry products, specifically eggs. An interactive discussion involving 20 community members from RW 18, Gebyog Village, Mojogedang District, Karanganyar Regency was conducted. This was followed by an extension program and mentoring on the preparation of aloe vera gel for egg preservation. Results showed an increase in knowledge about food additives, the benefits of aloe vera gel as a coating, and the skills required to prepare aloe vera gel as a coating for chicken eggs. In conclusion, the community's knowledge and skills in utilizing aloe vera gel as a natural coating for chicken eggs have significantly improved.

Keywords: Aloe Vera Coating; Farmer Empowerment; Natural Preservative.

Introduction

Aloe vera is a common plant in the community and is often overlooked because the community does not understand and optimize its uses and other benefits. Aloe vera, which we often do not know, can be used as a natural preservative; this natural preservation can also be used as a food product from oxidative and microbial damage (Paikra, 2017). Aloe vera plants are still considered a type of wild plant, even though aloe vera plants have many benefits for human life and as a preservation of livestock products, namely eggs. As a preservative function, aloe vera gel can be utilized as an edible coating to coat eggs that are coated on the shell.

Eggs are one of the most practical foodstuffs to use; they are rich in protein, carbohydrates, vitamins, and minerals and very easy to digest. Eggs are versatile because they can be used for various purposes, and young people can obtain them at a relatively cheap price, so the purchasing power of the general public can reach

them. As a food ingredient, eggs are a material that is easily damaged both physically and chemically due to contamination of microorganisms that enter through the skin's pores. Damage can cause a decrease in egg quality, including a decrease in egg weight due to evaporation of water and carbon dioxide, enlargement of air pockets, and chemical overhaul of the egg's contents. This damage can be seen by candling the signs of stains in the egg's contents. If the egg is left in the open air (room temperature), the egg only lasts 10-14 days; after passing that time, the egg undergoes changes towards damage. The longer the storage will be, the greater the time of evaporation of liquids and gases in the egg, which will cause larger air cavities that cause thick egg whites (Sudaryani, 2003). One way that can be used to prevent a decrease in egg quality is by coating the pores of the eggshell so that the entry of microorganisms into the contents of the egg can be prevented; thereby, its quality can be maintained. One of the coating materials that can be used to coat eggs is aloe vera.

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Aloe vera is one of the natural coating materials that are safe to use. Aloe vera has mucus that can be used to cover the pores of the eggshell and is known to have 75 compounds, including saponins, tannins, flavonoids, polyphenols, various vitamins, enzymes, anthraquinones, and 20 types of amino acids. The content of substances in aloe vera has anti-bacterial and anti-viral properties (Jatnika & Saptorningsih, 2009). Saponins are anti-microbial and can close the eggshells from evaporation so as to prevent evaporation in eggs (Surjushe et al., 2008).

The use of aloe vera until now has not been widely known in the community. However, in the industry, it has been applied in the food sector as a functional food that can withstand the rate of respiration (Valverde, 2005). Based on the description above, it is necessary to conduct training and enrichment for laying hen farm partners in the Mojogedang area on the use of aloe vera gel in eggshell coating to maintain shelf life and can be used as an alternative to extend shelf life during the distribution or marketing of eggs, from farmers to retail. Thus, as expected, the selling value will increase.

Method

Survey

The survey was carried out by directly visiting the partner area, namely by approaching partners located in Wates hamlet, Gebyog Village RT 01/18, Mojogedang District, Karanganyar Regency. The team conducted field observations, especially on partner partners, especially Micro, Small, and Medium Enterprises (MSMEs) in the field of layer farming business regarding the use of aloe vera gel and egg distribution. Additionally, the researchers explored knowledge about the use of aloe vera plants widely grown in the community, especially in their use in livestock products. Furthermore, the researchers also investigated the problems faced by the community, especially in the use of eggs that are quickly damaged due to shelf life and microbial contamination. Ultimately, the team offered alternative counselling, training, and assistance in making aloe vera gel as a preservative or as an eggshell coating to extend its shelf life during distribution.

Implementation

The planned implementation starts from the preparation of location permits to the provision of booklets and gel that are used as materials for training and mentoring to the community as follows:

- Conducting observations in RW. 18, Gebyog Village, Mojogedang District, with the aim of preliminary survey
- Licensing to local administrators regarding community service activities

- Conducting socialization about community empowerment to local officials
- Counseling on how to make aloe vera gel as a food preservative (eggs)
- Assisting in making aloe vera gel by the community service team to the community and breeder partners in the Wates hamlet environment.
- Conducting observations by the community service team and laying hen breeder partners on applying aloe vera gel to eggs in the shell for 14 consecutive days.

Testing

The training and mentoring success rate was measured by observing the participants' and partners' responses during the training. Pre- and post-tests were conducted with the targeted partners to assess their understanding of preparing and utilizing aloe vera plants.

Result and Discussion

Results

The first step taken in community service is socialization by the community service team at the partner location at the house of Mr. Triyanto, Gebyog Village, Mojogedang District. Socialization was carried out to convey the aims and objectives of community service, which are to be carried out by the community service team in relation to the socialization of work programs. The socialization was attended by representatives of each MSMEs in the field of layer farming and the owner.

The second activity was to conduct the first counseling, which was held on November 4, 2024, about securing livestock products with environmentally friendly basic materials. As for the material in the counseling presented, namely: a) processing and preservation of livestock products, especially eggs, b) the use of extending the shelf life of eggs, c) how to see physical damage to eggs, d) environmentally friendly preservatives and introducing aloe vera.

The level of knowledge of partners in the local area with partners, before the assessment was in the sufficient category and after in the good category, with the counseling on food additives as coatings.

Table 1. Knowledge level before and after counseling on additives

Category	N	Respondents' Answers			
		pre	%	post	%
Good	20	3	15	20	100
Sufficient	20	15	75	0	0
Inadequate	20	2	10	0	0
Total		20	100	20	100

The subsequent counseling is related to the manufacture of aloe vera gel (aloe vera) as a coating material for coating eggs on the shell, which helps extend the shelf life of eggs. The level of community knowledge about the benefits of aloe vera before and after the assessment, before counseling is categorized as many who do not understand, and after counseling, it becomes 100% understanding and a good level of knowledge. The next activity is to assist in making aloe vera gel; in addition to helping in making aloe vera gel, measurements of applicative behavior aspects regarding

the use of aloe vera gel for egg preservation are also carried out.

In the next activity, the observation of broiler eggs coated with aloe vera gel was made. The observations were made by the mentoring participants, namely 20 people accompanied by the service team. The results of observations of the shelf life of flavored chicken eggs have been coated on the benefits of aloe vera as a coating on purebred chicken eggs in MSMEs partners of layer farms on days 10-14 at normal temperatures, damage to the internal quality of the egg occurs.

Table 2. Observation Results of Egg Storage Time Coated with Aloe Vera Gel

Checklist														Day
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Color	8	8	8	8	8	8	8	8	8	7	7	7	7	7
Egg Consistency	8	8	8	8	8	8	8	8	8	7	7	7	7	7
Rotten	8	8	8	8	8	8	8	8	8	8	8	7	7	7
Shell Condition	8	8	8	8	8	8	8	8	8	8	8	8	8	8

Discussion

The environmental conditions of Gebyog Village, RW 18 Mojogedang District, Karanganyar Regency are common locations, and many laying hen farms are found. Most people in RW 18 have not utilized aloe vera, which is considered wild, as a preserved food product. Based on the preliminary survey results, almost all people, especially partners, use eggs in their daily lives as part of their daily food for direct consumption.

Eggs are a type of food product that is widely used in everyday life to fulfill animal protein needs. Chicken eggs (*Gallus gallus domesticus*) are a food ingredient that contains high nutritional values, is easy to process, and is relatively cheap when compared to other animal protein sources (Litbang Pertanian, 2010). Indonesia's chicken egg production increases by an average of 3.29% per year, while national consumption demand will increase by 4.78% per year (Nuryati et al., 2015). Eggs are food that is easily contaminated by microbes either directly or indirectly with sources of microbial pollution from soil, air, water, and dust. Contamination generally comes from egg-laying straw, soil, air, and poultry manure (Idayanti, 2009). Eggs, when stored at room temperature, only last 10-14 days; after that time, the

eggs undergo changes such as evaporation of water content through the pores of the eggshell, which results in a decrease in egg weight, changes in chemical composition and dilution of egg contents (Melia et al., 2009).

This counseling activity was attended by partners and their cubs and the community of RW 18 Mojogedang, Gebyog Village, with 20 people. Before and after the counseling, a questionnaire was filled out to measure the increase in knowledge of the participants. Before the counseling, the overall score was 95% in the good category and 5% in the fair category, and after the counseling, the result was 100% in the good category. The value of aspects of knowledge about preserving food additives from the participants, especially the cadres, as many as 20 people already have a good category (95%). This is because the partners often participate in similar training and are also supported by education that is not too low, namely high school and only one person with a sufficient category (5%). This is in accordance with research conducted by Zulhaida Lubui et al., which found that there was an increase in the average value of knowledge and action from partners by 2.428 points after the provision of training.



Figure 1. Aloe Vera Gel-Making Process

As for the level of knowledge about the use of aloe vera gel as a preservative for vegetables and fruit, the results obtained before counseling were only three people or 13.6% in the good category, and after counseling, the level of knowledge of laying hen breeder partners and the community in RW 18 Gebyog Village, Mojogedang District, Karanganyar Regency became 20 people in the good category or 100%. Before the counseling on the benefits of aloe vera, most people in RW 18 Gebyog Mojogedang Village, Karanganyar Regency only knew that the benefits of aloe vera gel for beauty alone had to go through a complicated process, so that aloe vera plants that are widely available in the community yard are only considered as ornamental plants that have little beneficial value. After counseling and mentoring on the benefits and how to make aloe vera gel as a preservative for fruits and vegetables, the residents gained a deeper understanding of aloe vera's potential as a natural and accessible preservative. Other research states that the antifungal contained in aloe vera gels and extracts is quite significant, but the greatest potential is in the gel form (Kohar et al., 2018). The mechanism for inhibiting fungal growth is by reducing the tension of the cell wall surface and damaging membrane permeability so that protein leakage from the cell occurs (Wijaya & Masfufatun, 2022).



Figure 2. Aloe Vera Gel Coating Egg Supervision Team

The assistance provided is making aloe vera gel first, guided by the community service team. After making aloe vera gel, it is continued with the edible coating process or the process of coating eggs with aloe vera gel on the shell. Furthermore, eggs that have been coated with aloe vera gel are observed by several representatives of broiler chicken breeder partners and by the community service team using observation instruments. The observation instruments seen are from the aspects of colour, egg consistency, rot, and shell condition (Putu et al., 2021; Sarifah Ainy et al., 2022). The community service carried out by the team and the community of RW 18 Gebyog Village, Mojogedang District, Karanganyar Regency, is to coat eight eggs for

observation; from the observation results obtained on day 1 to day 9, all eggs meet the requirements from the aspects of color, egg consistency, rottenness, and shell condition.

Natural ingredients for food preservatives are still very rarely used. Usually, the market uses chemicals to make preservatives for food. The use of natural ingredients as the main ingredient of food preservation is an effort and step that is safe and good for health and even the environment. The main natural ingredients in making preservatives can use aloe vera gel, where aloe vera itself has an oxidase enzyme as an antioxidant that can inhibit oxidation in food, which can inhibit decay in fruit, especially fruit that does not need to be peeled off the skin for consumption. The advantage of this aloe vera-based gel is that it has anti-microbial, namely *acemannan* substances known as antibiotics and anti-fungi, which play a role in inhibiting the growth of microorganisms that play a role in food poisoning due to consumption of food that has rotted, and this gel is environmentally friendly compared to chemical preservatives (Kohar et al., 2018).



Figure 3. Results of Aloe Vera Gel Coating on Chicken Eggs

Based on the results of several studies, a good tomato to be coated with aloe vera gel is a purebred chicken egg to extend the shelf life by coating with aloe vera gel will be perfect so that it has a longer shelf life (12 days) with egg conditions that are still good in external and internal quality.

Conclusion

Changes in knowledge about food additives after counseling increased to a good category, while knowledge about the benefits of aloe vera gel as a food preservative after counseling increased by 100%. After the assistance increased, the results of observations about skills in making aloe vera gel as a tomato fruit coating material. The results obtained are the results of observations of the shelf life of tomato fruit that has been coated about the benefits of aloe vera as an edible coating on broiler eggs in RW 18 Gebyog Village,

Mojogedang District, Karanganyar Regency, on day 14, just experienced damage to broiler eggs.

References

- Ainy, N. S., Lediawati, W., & Hadi, N. (2022). Uji Organoleptik Penambahan Jus Buah Jambu Biji Merah (*Psidium guajava* Linn) Terhadap Tingkat Kesukaan Responden Pada Yoghurt Susu Kambing Etawa. *INSOLOGI: Jurnal Sains dan Teknologi*, 1(1), 18-27.
- Andriani, E. S., Nurwantoro, N., & Hintono, A. (2018). Perubahan fisik tomat selama penyimpanan pada suhu ruang akibat pelapisan dengan agar-agar. *Jurnal Teknologi Pangan*, 2(2), 176-183.
- Bejar, F., Aquino, R., Sabijon, J., Bejar, E., Mante, L. E., & Corrales, R. (2020). Aloe vera Extract as Bio preservative to Selected Perishable Fruits and Vegetables. *Journal of the Austrian Society of Agricultural Economics*, 16(6), 205-214.
- Darmawati, S., & Nurullita, U. (2009). Perbedaan variasi lama simpan telur ayam pada penyimpanan suhu almari es dengan suhu kamar terhadap total mikroba. *Jurnal Kesehatan*, 2(1), 19-26.
- Fauziah, S., Hasyim, U. H., Maresa, S., Purnawan, I., & Hendrawati, T. Y. (2020, December). Pengaruh Edible Coating Aloe Vera Terhadap Daya Tahan Apel, Wortel Dan Stroberi Selama Penyimpanan. In *Prosiding Seminar Nasional Penelitian LPPM UMJ* (Vol. 2020).
- Irene, I. J., Zaenab, Z., & Rasjid, A. (2022). Pemanfaatan Gel Lidah Buaya dalam Memperpanjang Daya Simpan Tomat (Eksperimen). *Sulolipu: Media Komunikasi Sivitas Akademika dan Masyarakat*, 22(1), 74-79.
- Kohar, T. A., Yusmarini, Y., & Ayu, D. F. (2019). Aplikasi edible coating lidah buaya (aloe vera l.) dengan penambahan karagenan terhadap kualitas buah jambu biji (*Psidium guajava* L.). *Sagu*, 17(1), 29-39.
- Melia, S. J., & Africon, I. (2009). Teknologi Pengawetan Telur Ayam Ras Dalam Larutan Gelatin Dari Limbah Kulit Sapi. *Laporan Penelitian Dosen Muda. Fakultas Peternakan Universitas Andalas, Padang-Sumatera Barat*.
- Nuryati, L., B. Waryanto, Novianti. (2015). (Outlook Telur) Komoditas Pertanian Sub Sektor Peternakan. Pusat Data dan Sistem Informasi Pertanian.
- Pemerintah RI. (1996). UU RI No. 7 Tahun 1996 Tentang Pangan. Jakarta: Lembaran Negara RI
- Wadhani, L. P. P., Ratnaningsih, N., & Lastariwati, B. (2021). Kandungan gizi, aktivitas antioksidan dan uji organoleptik puding berbasis kembang kol (*Brassica oleracea* var. *Botrytis*) dan Strawberry (*Fragaria x ananassa*). *Jurnal Aplikasi Teknologi Pangan*, 10(1), 6-12.
- Wijaya, I. K. W. A., & Masfufatun, M. (2022). Potensi Lidah Buaya (Aloe vera) sebagai Antimikroba dalam Menghambat Pertumbuhan Beberapa Fungi: Literature Review. *Jurnal Kedokteran dan Kesehatan*, 18(2), 202-211.