PROCEEDING

Food Globalization:
New Technology in An Era of Change

The 10th National Student Conference on food science & technology

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Proceedings

The 10th National Student Conference

Food Globalization : New Technology in An Era of Change

Penerbit Universitas Katolik Soegijapranata
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PLENARY SESSION

FOOD PRODUCT DEVELOPMENT

FOOD QUALITY AND SAFETY

FOOD MARKETING AND BUSINESS

FOOD ENGINEERING

Preface 10th NSC – "Food Globalization: New Technology in An Era of Change"

This is a proceeding of the 10th National Student Conference on Food Science and Technology done by Food Technology Department, Soegijapranata Catholic University. Seeing that this conference is organized by only the students of the faculty, ten consecutive years of performance deserves quite praise. Thanks to their powerful motivation and energy, this event can be held in routine without skipping a single year.

In this year conference we focused on the development of food in globalization era. As we know it, since globalization has begun there has been lots of changes in many sectors of life including food. On the bright side, it can be seen that globalization has made food become highly varied, more "functional", and somewhat safer by using new material, more sophisticated technology, or even change the food source's genetic structure. Although there are a lot of advantages in the era of food globalization, there will be many risks that make people have to be aware in consuming the foods.

The conference was specifically designed to discuss all of these matters, where students of food technology department can share their research and opinion. This proceeding covers two sections of paper that are papers of the keynote speakers and also from the presenters. There are six platform themes that were used: *Food Product Development*, *Food Quality and Safety, Food Management and Business, Food Engineering. Food Microbiology & Biotechnology* and *Functional Food.* With the ongoing changes in food related to the current globalization, I am quite sure there will be more topics that can be discussed in other student's conferences or academic communities.

Semarang, January 7, 2010

Alberta Rika Pratiwi
Chairman of the Steering Committee

PREVENTING EGG SHELL OF LAYER AGAINST *SALMONELLA* CONTAMINATIONS

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ABSTRACT

Egg is a common foodstuff in Indonesia as well as in the rest of the world. This is an animal protein source that is easily found anywhere, because the price is cheap compared to the other animal protein sources, therefore egg is more affordable by most people. Consequently, the consumptions rate is higher than the others of animal's protein sources. Furthermore, the egg processing technique has also been developing rapidly toward fast growing of food products variation can be made from egg, be there for real meal, snacks, or many kinds of street food. The consumptions of egg mainly produced from chicken layer. Nowadays, Indonesia produces about 1,15 million tons per year of chicken layer egg. Over the last twenty years, many researches have been concentrating on the quality of egg, particularly concerning on the high contaminations of a bacteria, namely *Salmonella*. Some researches have demonstrated that the bacteria can do the penetration into inside of egg through eggshell pores. The main factors of *Salmonella* contamination was the faecal dirt on the eggshell surfaces. *Salmonella* it self can cause some diseases like diarrhea, stiff, headache, and so on. On the other hand from our survey we found that the average farmers collected the egg three times a day and not washed immediately, this means the egg would be cleaned more then 8 hours since they were laid by the chicken. This period of time since egg was laid until cleaning would let the bacteria to penetrate into the egg shell. Due to the inadequate equipment and facilities, the egg produced by traditional chicken farms was more risky to be contaminated by *Salmonella*. This survey awaits a series of intensive research to define the most optimum time to washing the egg since been laid and the washing technique applicable at farm level.

Keyword : *chicken layer, egg, contamination, eggshell, washing*

INTRODUCTION

Egg is a common foodstuff in Indonesia as well as in the rest of the world. This is an animal protein source that is easily found anywhere, because the price is cheap compared to the other animal protein sources, therefore egg is more affordable by most people. Chicken eggs are the most commonly eaten eggs. They supply all essential amino acids for humans, and provide several vitamins and minerals, including vitamin A, riboflavin, folic acid, vitamin B6, vitamin B12, choline, iron,

calcium, phosphorus and potassium. They are also an inexpensive single-food source of protein. But eggs are often blamed as one cause of food poisoning (Cox et al., 2002). There are a lot of poisoned cases or diseases in Indonesia caused by microbial contaminated food as the salmonellosis, even by expired food. Salmonella causes disease plays a major role in the human diet. Nowdays, we also found contamination on eggshells containing pathogenic bacteria. According to WHO, Salmonella enteritidis Pt 8 is a major cause of Salmonella bacteria in addition typhymurium which are well known (Timoney, 2009). As early as 1967, contamination of Salmonella can through chicken manure (Williams and Whittemore, 1967).

Other animals also can become infected with salmonella in the time of the slaughter in a slaughterhouse by a knife or another tool used and water wash containing Salmonella (Angen, 1996). Therefore, the food due to infection with salmonella, in this case is the egg, deriving from foodstuffs, such as cattle meat, chicken or eggs cooked less than perfect or because the manipulation of food are not well of cooking. On the basis of research results, the insecurity of meat from poultry and products processed in Indonesia is due to several factors, among others, the level of knowledge of farmers, clean cages, as well as water and food sanitation, pollution of salmonella in chickens in Yogyakarta farms Sleman District reached 11.40% meat and 1, 40% in eggs. The lack of sanitation cage can lead to contamination of unwanted pathogenic microbes (Barrow and Lovell, 1991).

Some researches have demonstrated that the bacteria can do the penetration into inside of egg through eggshell pores (Clay and Board, 1991). The main factors of *Salmonella* contamination was the faecal dirt on the eggshell surfaces (Williams and Whittemore, 1967). *Salmonella* it self can cause some diseases like diarrhea, stiff, headache (Keller, et al., 1995), and so on.

METHOD

This paper was prepared by conducting two series of studies. The first one was conducting a field survey to a chicken layer farm. The second one was literature research focusing on the mechanism of Salmonella infection and the effect of the infection. These two series of study, then used to conduct three phases of study as follows:

1. Exploring the critical stages of execution of post-harvest egg laying hens, since eggs are removed from chicken, egg collection, cleaning, transportation, washing, pengatusan, setting on a shelf transport, to transport.

2. Through a desk study to conduct literature hunting and searching the internet, about the mechanism of infection with Salmonella bacteria into the egg, the pattern of proliferation, the dangers posed when Salmonella-contaminated eggs still be consumed, as well as physical and biological characteristics of Salmonella.
3. Analyzing the findings of the field by referring to reference both research results and reviews obtained from literature study.

The third phase of the study was basically analysis on the compliance with the conditions of chicken layer cultivation operated by small scale farms and thus found in the literature review.

RESULT AND DISCUSSION

An egg is one of food products produced by poultry breeder that is easy broken and spolied, therefore it needs a serius handling, it is however seems to be a common foodstuff in Indonesia as well as in the rest of the world (Stephenson et al., 1991). This is an animal protein source that is easily found anywhere, because the price is cheap compared to the other animal protein sources, therefore egg is more affordable by most people. Consequently, the consumptions rate is higher than the others of animal's protein sources. Furthermore, the egg processing technique has also been developing rapidly toward fast growing of food products variation can be made from egg, be there for real meal, snacks, or many kinds of street food. The consumptions of egg mainly produced from chicken layer. Nowadays, Indonesia produces about 1,15 million tons per year of chicken layer egg. Over the last twenty years, many researches have been concentrating on the quality of egg, particularly concerning on the high contaminations of *Salmonella*. A number of researches have demonstrated that the bacteria can do the penetration into inside of egg through eggshell pores (Barnhart et al., 1991, Bichler et al., 1996, Braun et al., 1995).

On the other hand from our field studies we found that the average farmers collected the egg three times a day and not washed immediately, this means the egg would be cleaned more then 8 hours since they were laid by the chicken. But we found in our survey, that farmers in Mataram's Farm, Bandungan, Central Java, collected the egg twice a day and just dirty egg have washed. Whereas eggs that looks clean not washed, actually Salmonella not seen directly, it means that post harvest handling of egg in Central Java more have a high risk than the others. This period of time since egg was laid until would let the bacteria to penetrate into the egg shell. We also found that farmer in Bandungan just used mop to clean egg's surface so it is not clearly clean.

Due to the inadequate equipment and facilities, the egg produced by traditional chicken farms was more risky to be contaminated by *Salmonella*. The consumption of egg in Indonesia is high enough, but the post harvest handling is not well enough, the post harvest handling of egg should be better to decrease the contamination of *Salmonella*. This survey awaits a series of intensive research to define the most optimum time to washing the egg since been laid and the washing technique applicable at farm level.

Type of disease	Salmonelosis
Agens etiologi	Bakteri: *Salmonella* serotipe non-tifoid.
Agens characteristis	Gram-negative bacteria, mesophilic, motile, facultative anaerobic rod-shaped and do not form spores. Growth can occur at temperatures between 5-47oC. Optimal growth occurs at a temperature of 37oC. The minimum value of pH and aw for growth of this bacterium, respectively 4 and 0.95.
incubation period	6 – 48 hours
duration	Usually the day a few weeks but sometimes these infections can last up to 3 weeks.
symptom	The main symptoms include fever, headache, nausea, vomiting, abdominal pain and diarrhea.

CONCLUSSION

Salmonella contamination on chicken egg has been concerned by many researches over the last twenty years. Salmonella it self can cause some diseases like diarrhea, stiff, headache, and so on.

Field investigation to small chicken layer farm, it was found that the average farmers collected the egg was three times a day and not immediately washed after the collection, means the egg would be cleaned more then 8 hours since they were laid by the chicken.

This period of time since egg was laid until cleaning would let the bacteria to penetrate into the egg shell, particularly due to the inadequate equipment and facilities.

These all mean that egg produced by traditional chicken farms was risky to be contaminated by Salmonella.

This survey awaits a series of intensive research to define the most optimum time to washing the egg since been laid and the washing technique applicable at farm level.

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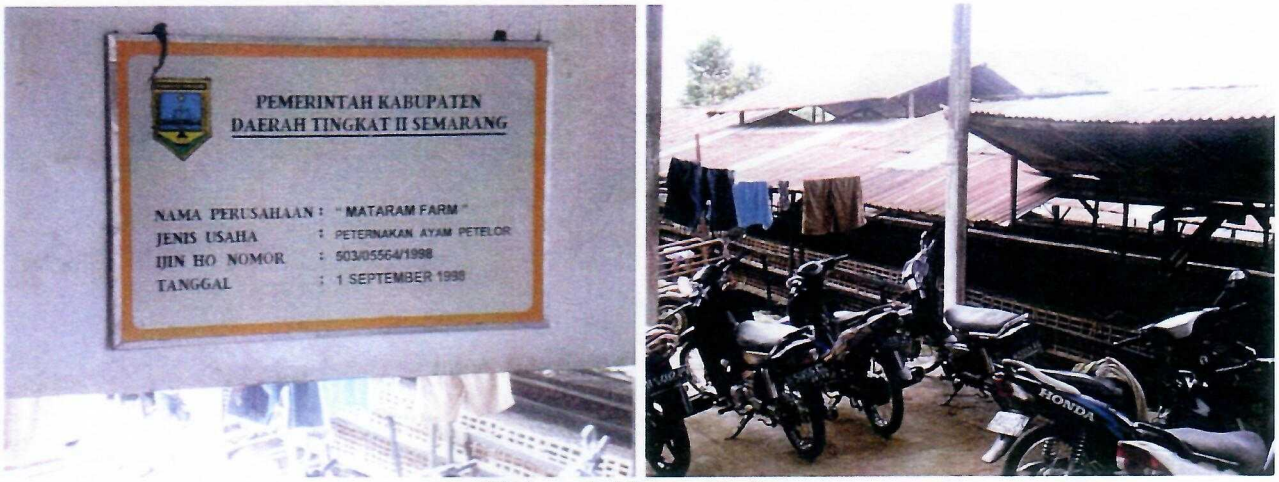
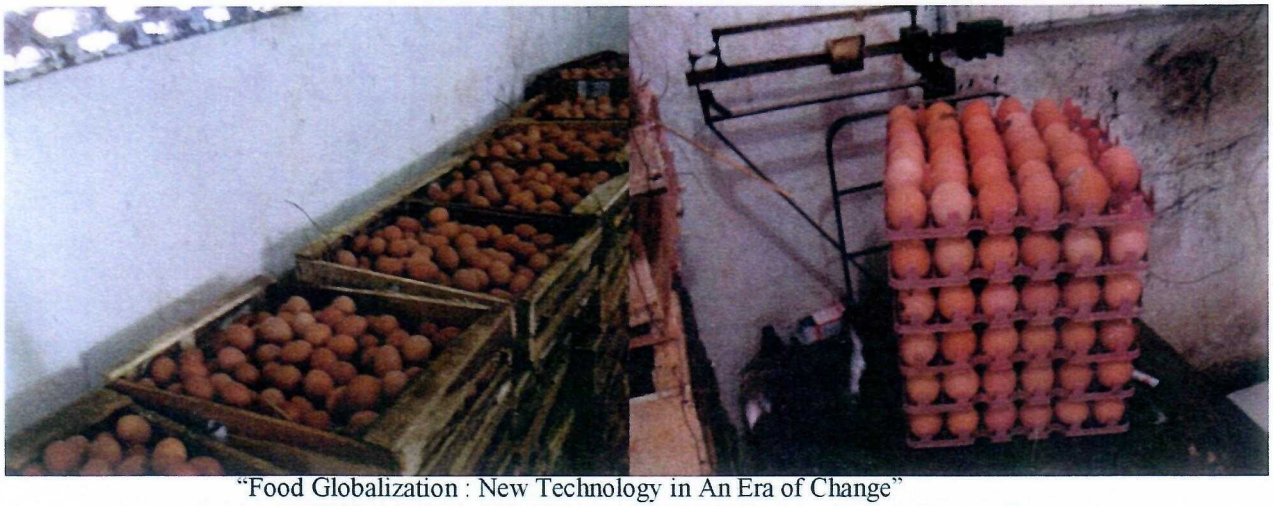
APPENDIX



Picture 1. Mataram's farm

Picture 2. Winda, Chitra, and Della were looking for the observation in the Mataram's farm



Picture 3. The Storage of eggs in Mataram's farm

Picture 4. The washing of eggs in Mataram's farm