Improving production processes and manpower per production to reduce labor costs. In the chick farm industry, the factory closed in Chonburi Province

Ntapat Worapongpat[1] , Cjaimongkon pornkamon[2]

Center for Center for Knowledge Transfer, Technology, Community Innovation, Entrepreneurship, Tourism and Education Eastern Institute of Technology Suvarnabhumi (EITS) And Educational Innovation Institute Association for the Promotion of Alternative Education (EII)

dr.thiwat@gmail.com 0955426414

Received *March 14, 2024;* ***Revised*** *May 20, 2023;* ***Accepted*** *June 20, 2023*

Abstract

This study aims to improve the production process and determine the appropriate number of employees per production line. This results in a more efficient production line. Focusing on reducing waste from The work of employees is reduced. and the process of raising chicks. This study has applied the principles of Studying work and studying time at work Analyzing using work charts of employees and machines and applying ECRS principles, a theory that helps reduce losses from damage costs. or costs that do not generate any returns for the organization. It also helps increase productivity and profits. Come analyze and find ways to improve to reduce work waste.

From the study results it was found that Processes interested in solving problems can improve and standardize the number of employees by considering the population, including farm employees, 36 employees, 4 supervisors, a total of 40 people. The sample group includes 14 people using Purposive Sampling. Before improving the time it took to lay chicks, one time took 15 hours/time. After improving the process, the time will be reduced to 10 hours/time. The time can be reduced by 5 hours and it also results in the reduction of labor costs from approximately 190,512 baht per month to 126,000

baht per month. The human labor costs can be reduced by 64,512 baht per month, although the improvement involves investment in purchasing machinery. But reducing labor costs gives a break-even point of 6-7 months.

Keywords: Reduce human labor costs, reduce working time, reduce customer waiting time.

Introduction

Since the Thai economy, including the agricultural economy, has continued to expand, it is a result of the economic recovery. To reduce the loss of both working time and productivity, as well as control production to be constant and continuous to meet the needs of customers and excessive work of workers that hurt the health of employees. Operators are therefore very focused on operators in the work process. Raising chicks to vaccinate laying chicks Information from the Thai Chicken Producers for Export Association Stated that raising broiler chickens in Thailand Breeds are selected naturally. and continuously develop the breed Makes chickens grow fast and strong Meanwhile, broiler chicken feed has been developed to have nutritional value according to the needs of the chickens at different stages of life. For maximum efficiency in nutrition Makes chickens grow according to the potential of the breed standard. without using hormones to accelerate growth Along with providing an environment for raising animals with a closed, air-conditioned greenhouse system with water evaporation. The temperature is controlled to suit the growth of chickens. There is plenty of space for the chickens to express their natural behavior freely. In addition to the cool air inside the house, it helps the chickens feel comfortable and not stressed. and have better health at Pathompong Homsri, Jakkraphan Kongthana. (2013)

Importantly, it is also traceable to the animal feed corn raw materials. One in the broiler supply chain At present, Thailand's large private sector such as CPF places importance on producing sustainable products in line with EU policies. Partner countries that focus on producing sustainable products Also known as the European Green Deal, it

encourages farmers to grow maize in an environmentally friendly manner. Use science to help increase productivity. Chatnarong Saksuthamdee, Pramuk Srichai Wong, Samart Sinthon, Sasasin Lamaisri, Kantinan Namta, Thani Tangthong (2565) emphasize planting on legal land by organizing registration. cultivation Makes it possible to trace back to the source of cultivation. and can confirm that all animal-feed corn is 100% not from encroached forests and is free from post-harvest burning. This reduces dust and smog problems. Choosing to eat CP chicken therefore is like eating dust-free chicken that helps reduce the environmental burden on the world in another way. The main standards for animal welfare (Animal Welfare) are another standard that reinforces food safety. It is a strict standard that trading partners around the world, such as the EU, attach importance to. Thailand through "CPF" is the first operator outside of Europe to receive animal welfare certification from England (Assured Chicken Production certificated, UK) since 2003 and still has. Development has continued until today. Chatnarongsak Sutham Dee, Pramuk Srichaiwong , Samart Sinthon , Sasasin Lamaisri , Kantinan Namta , Thani Tangthong. (2565)

The researcher is therefore interested in studying management and cost management in the factory chick farm industry. Helps ensure animals are in a good environment. Makes animals healthy, grows according to age, is not sick, and has no need to rely on antibiotics. or growth hormone This has a positive effect on the quality of the meat that will be passed on to consumers so that they can eat chicken from the Thai broiler industry with confidence.

Research objectives

1. To reduce costs in employee wages. In the chick farm industry, factories closed in Chonburi Province.

literature review

The researcher studied research and literature. Including various media To understand the subject that will be studied to use as a guideline for

this research study. From the study of research and related literature, it was found that Adopting work study methods by studying details of work and time research. Used to improve production processes

(2) Jirawat Sriiam: 2013 Reducing production costs in terms of labor and increasing efficiency of employee work In the working process of the automotive side mirror production line By researching work and time of the work of people and machines in the production process Then analyzed using ECRS techniques to reduce working time and production scheduling techniques. To increase the work efficiency of employees After the renovation, the number of employees decreased from 18 people to 6 people and caused the overall labor costs to decrease by 5400 baht/day to 2,643.75 baht/day. It also caused labor efficiency to increase from 55.67% to 92.62%, an increase of 36.96%.

(3) Sunan Ruk Sirathai: 2009 Conducted a study to increase the productivity of the HGA testing machine, which is the process of testing hard disk read heads. By studying how to work Divide work into subtasks and Analyze details of sub-tasks using man-machine charts. Machinery wastes time waiting for work. while the employee inspects the workpiece Therefore, we use the concept of eliminating waste and brainstorming methods to reduce waste. This leads to a new way of working by setting up a station to inspect the workpieces before they are brought into the machine and after the workpieces are taken out of the machine. As a result, the machines work continuously and have an increased production rate. From the original 122 pieces/hour to 163 pieces/hour, representing an increase of 33.6%, making it possible to reduce machinery costs.

(1) Kunthida Asakit, 2023 Improving the efficiency of frequency-operated parts factories Relying on work-study techniques by using production process analysis techniques regarding production charts. and used questionnaires and weights to find the most problematic processes. After finding problems in the assembly and stamping processes, the technique of dividing the causes of problems was used using fishbone charts. When finding the cause of the problem that causes the efficiency of this process to be low It is a succession of previous processes and redundant work steps. The researchers solved the problem by using ECRS principles by designing new tools and error prevention principles (POKAYOKE) to apply to reduce machine adjustment time. As a result, the work process can be reduced from 14 steps to 11 steps. Working time increased from 4.76 hours to 3.68 hours, accounting for 22.69% of the assembly process. and reducing the time for setting up machines from 18 minutes to 5 minutes, the original working time from 0.97 hours to 0.75 hours, accounting for 22.68%

Research Conceptual Framework

Work study is the study of movement and time, which refers to a technique for analyzing the steps of a job to eliminate unnecessary work. and find the best and fastest way to work in that job Including improving the standards of work methods Various tools and training employees to work in the correct way Finding standard work hours to increase productivity

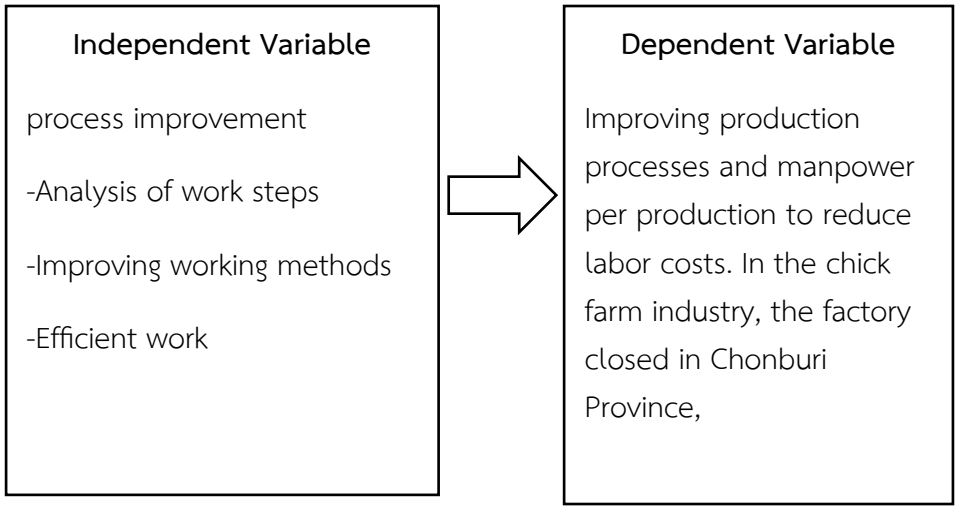

Diagram 1 Conceptual framework.

How to conduct research

This research is qualitative (Qualitative Research) with research methods as follows.

1. Population and sample groups in the research include:

The population includes farm workers, 36 employees, and 4 supervisors. Total 40 people. The sample group was by purposive sampling of 14 employees.

2. Research tools include 1) Questionnaire consisting of Part 1: General status of the respondents. It has the characteristics of a survey, part 2, a questionnaire on the work of employees of the hatchery and chicken farm departments. It is a rating scale (Rating Scale) with 5 levels.

3. Data collection includes collecting data from 1) primary data (Primary Data) is information obtained from inquiries with target groups and using questionnaires. 2) Secondary data. (Secondary Data) is information obtained from collecting information from various documents (Document Research) such as books, textbooks, academic documents, research, and related electronic media, etc.

4. Data analysis includes: Data analysis is 1) qualitative data analysis By using the information obtained from Inquiry with the target group of 14 people

5. Statistics used in the research include a ready-made descriptive statistics program consisting of percentage (Percentage) and mean (Mean). Standard deviation (Standard Deviation)

1 General information about raising chickens

The traditional process of laying chicks Before the process was improved new chick production

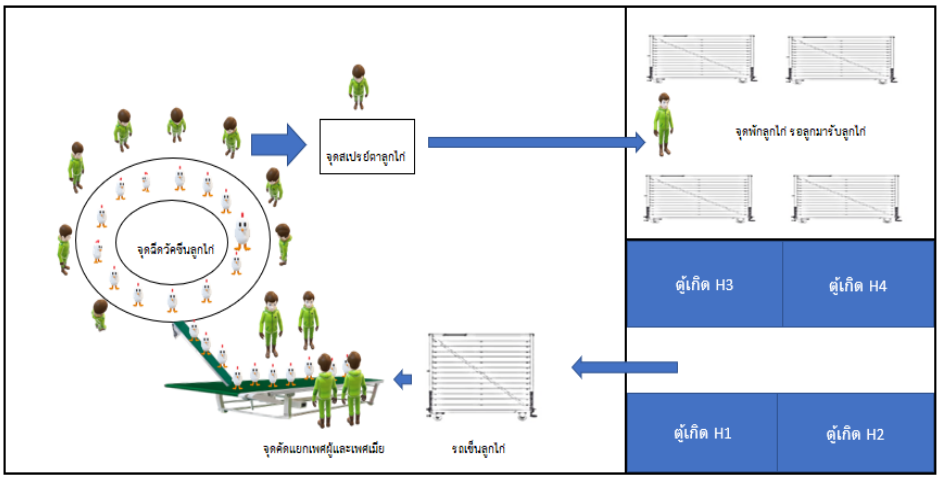

Figure 1 : Traditional chick raising process and tools used.

From picture 1 process Production involves a total of 14 workers per chick-laying and 50,000 chicks. One chick-laying takes approximately 15 hours. In total, there

are 14 workers per chick-laying. causing human labor costs Consists of labor costs and Overtime pay It was found that direct labor costs were 13,608 baht per month per person. Therefore, the total cost of labor costs per month per 14 people would be equal to 190,512 baht per month. Therefore, they searched for imported machinery to improve the process. Laying of chicks and number of individuals

2. Machinery cost analysis

2.1 Table of analysis of production capacity data in the farrowing process Human and machine labor

Human and machine labor cost analysis	Vaccination of chicks in 1 hour	working hours
Labor per chick vaccination/hour/person	800-1000 pieces/hour	15 hours/time
Use of machinery in vaccination work/hour	2500-3000 pieces/hour	About 9-10 hours/time

Table 2.1 from data analysis Found that in the process Raising chicks requires human labor per chick vaccination, equal to 800-1000 chicks/hour, which takes 15 hours of work, which makes the cost of chicks the same as walking, but reduces the profit of the chicks. Therefore, a machine was sought to improve the production of chicks to reduce labor costs.

Picture 2. Infrared beak cutting machine.

Implementation of the plan

Table 1.1 Operational plan

Operation steps	Aug. .	ก . ย .	Oct.	Nov. Y.	Dec.	Jan.
1. Study the current production process.						
2. Collection of information on production processes						
3. Study information about the Infrared Chicken Beak Cutting Machine .						
4. Proceed with bringing in machinery to improve the process of laying chicks.						
5. Carry out installation of machinery and production lines.						

Expected benefits:

1. New work and process improvements Raising chicks to reduce work time

2. Production rate increases with reduced labor.

3. Improves the number of employees used in production. This will result in reducing human labor costs. Information on new process improvements for production lines

By bringing in 2 machines to help with the work to be more efficient and improving the production line to be in line with the machinery used in the improvement.

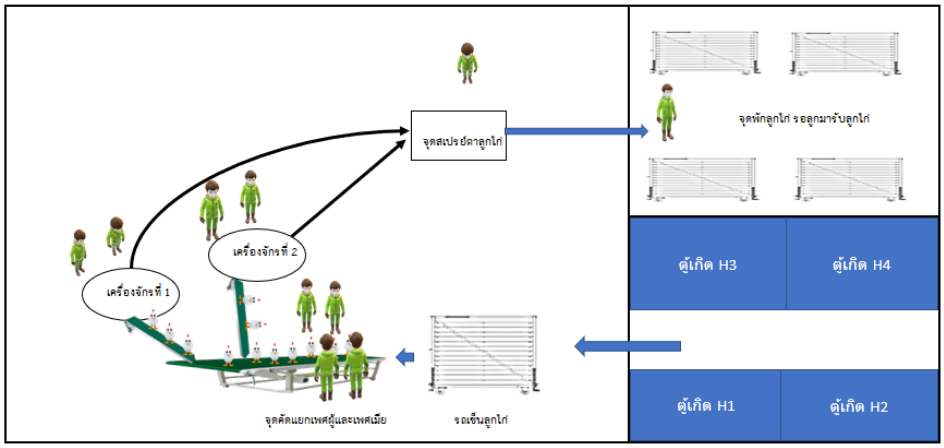

Figure 2.1 The main process for improving the new production line.

From Figure 2.1 After improving the process In the new production, it will be found that in production the number of people will be reduced. From 14 people, there will be 10 people left per 1 time of laying chicks. For every 50,000 chicks, it will take less time to lay chicks 1 time. follow along The work will be approximately 10 hours. In total, there will be 10 employees working per 1 time of laying chicks.

Table 2.2 Compare the number of employees before and after the improvement per production

Production process	Number of employees before process improvement (people)	Number of employees after process improvement (people)
Chick sex selection	4	4
Chick vaccination	8	4
Spray the chicks' eyes.	1	1
K Leon moved the chicks to the chick room, waiting for the customer to come pick them up.	1	1
1 time of laying chicks	14	10

From Table 2.2, the number of employees per 1 time of laying chicks, before improvement, using the number of employees equal to 14 people per production per work. which after improving the production process There was no problem of unemployment among people. The number of employees decreased to 10 people, accounting for 71%.

Table 2.3 Comparing the working time of laying chicks once, the chicks will be laid 8 times per month. Before renovation and after renovation

details	Before improvement (Dec. 2021) (hours)	After improvement (Jan. 2022) (hours)
Time to lay 1 chick	15	10

From Table 2.3, it can be found that before improving the time required to lay chicks, one time took 15 hours/time. After improving the process, the time will be reduced to 10 hours/time. The time that can be reduced is 5 hours or 66%.

Table 2.4 Compare monthly employee costs Before renovation and after renovation

details	Expenses (Baht per month)		
	the renovation (Dec. 2021) (Baht)	After improvement (Jan. 2022) (Baht)	After improvement (Feb. '65) (Baht)
Labor costs per employee	10,080	10,080	10,080
Overtime pay /person	441 x 8 = 3,528	315 x 8 = 2,520	315 x 8 = 2,520
Total cost/month	190,512	126,000	126,000

From Table 2.4, it can be found that before adjusting the overtime cost used to raise chicks once, it will be 441 baht/time, but in one month The laying of chicks will be 8 times/month and will be calculated as follows: Labor costs + (overtime costs x number of times/month) x number of people will equal 10,080 + 3,528 x 14 = 190,512 baht/month after improving the cost work used. It will be 10,080 + 2,520 x 10 = 126,000 baht/month. Costs can be reduced to 64,512 baht/month.

Summary of research results

From studying the production process Using the principles of work–study and studying the time to work in each step of the case study of the process of laying chicks in the process section Chick vaccination Found a problem in determining the number of people and machines. In the production process, ECRS principles and loading and unloading techniques are applied. It is a guideline for improving the standard of the number of employees to be suitable for production. Which is shown in section 2. The results from the improvement can be summarized as follows.

Summary of results of production improvement operations

1. Standard number of employees per production.

Number of employees per production	Before improvement	main improvement
Laying chicks in 1 time	14 people	10 people

2. Employee performance

Employee performance	Before improvement	After improvement
Laying chicks in 1 time	15 hours	10 hours

Explain the results

From the results of research on improving the production process and manpower per production to reduce human labor costs in the chick farm industry, closed factories in Chonburi Province. It was found that before adjusting the cost of overtime used to raise chicks once, it would be 441 baht/time, but in one month Laying chicks will be at 8 lacs/month, cost before process improvement. Raising chicks with human labor is 190,512 baht/month. After improving the work, the cost is 126,000 baht/month. The cost can be reduced to 64,512 baht/month, which is consistent with (4) Wutthipornsri Pairoj, Samerjithom Rosukon, (2015). Improving the production process and manpower per production line to reduce Labor costs (No. 90593). Thammasat University.

Suggestions

1. This research focuses on improving the process. New ways of working for employees to be suitable for production to reduce labor costs To produce fewer chicks in terms of operations of the number of people Defined organizational standards which is the time in the process of laying chicks With too many people spending too much time which makes the process Mechanized chick production takes less time and reduces unemployment.

2. The next research should include training before using machines every time so that employees know using them. Helps reduce the chance of malfunctions while using the machine.

Refer

(1)Kulthida Asakit , 2023, Improving the production efficiency of frequency generator equipment parts with work study techniques , Chiang Mai University , Faculty of Science , Department of Chakkrit Industrial Management

(2)Jirawat Sriiam , 2023, Heuristic for organizing manpower of various assembly lines to reduce labor costs , King Mongkut's University of Technology Thonburi , Faculty of Engineering , Department of Industrial Engineering and Production Systems

(3)Sunan Rerksira Thai , 2023 , study of work to increase productivity for testing hard disk read heads , King Mongkut's University of Technology North Bangkok , Faculty of Engineering , Department of Industrial Management Engineering

(4) Wutthipornsri Pairoj , Samerjithom Rosukon , (2015). Improving the production process and manpower per production line to reduce Labor costs (No. 90593). Thammasat University.

Pathompong Homsri , Chakrapan Kongthana. (2013). Improving the efficiency of industrial supply chains: a case study of a sauce and Medium and small size chicken sauce. Kasem Bundit Engineering Journal, 3(2) , 26–47.

Chatnarong Saksuthamdee , Pramuk Srichai Wong , Samart Sinthon , Sasasin Lamaisri , Kantinan Namta , Thani Tangthong. (2022). Developing a system and transferring innovative technology for raising organic native chickens. Integrated business to raise Income level of the community in Kao Ya Dee Subdistrict, Kaeng Khro District , Chaiyaphum Province. Administrative Journal and local innovation , 6(1) , 1–14.

Figure 1. Traditional chick-raising process and tools used , source : https://www.ceva.co.th/node_ 24465/ node_ 24466/ node_ 26480/ node_ 26482/ node_ 26506 . (24- March - 2566)

Picture 2. Infrared beak trimming machine , source : https://www.poultryhub.org/all-about-poultry/health-management/beak-trimming . (24- March -2023)

.