

# Automation of the house washing process in the poultry industry

Flores Sánchez Verónica<sup>1</sup>, Eliab Eduardo Pacheco Espinoza<sup>2</sup>, Vallejo Hernández Arely<sup>3</sup>, González Sánchez René Aurelio<sup>4</sup>, Juaréz Borbonio Jesús<sup>5</sup>, Chama Esteban José Luis<sup>6</sup>

<sup>1</sup>Department of IMI, Universidad Tecnológica del Centro de Veracruz, Veracruz, México  
Email: [calidad.utcv@gmail.com](mailto:calidad.utcv@gmail.com)

<sup>2</sup>Department of IMI, Universidad Tecnológica del Centro de Veracruz, Veracruz, México  
Email: [4928@utcv.edu.mx](mailto:4928@utcv.edu.mx)

<sup>3</sup>Department of IMI, Universidad Tecnológica del Centro de Veracruz, Veracruz, México  
Email: [arely.vallejo@utcv.edu.mx](mailto:arely.vallejo@utcv.edu.mx)

<sup>4</sup>Department CBTis 192, Centro de Estudios Tecnológicos y de Bachilleres 192, Veracruz, México  
Email: [gonzalez.rene.d026@cbtis192.edu.mx](mailto:gonzalez.rene.d026@cbtis192.edu.mx)

<sup>5</sup>Department of ER, Universidad Tecnológica del Centro de Veracruz, Veracruz, México  
Email: [jesus\\_borbonio@utcv.edu.mx](mailto:jesus_borbonio@utcv.edu.mx)

<sup>6</sup>Department of IMI, Universidad Tecnológica del Centro de Veracruz, Veracruz, México  
Email: [jose.chama@utcv.edu.mx](mailto:jose.chama@utcv.edu.mx)

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**Abstract**— Good manufacturing practices impact the productivity of the processes, farms and food factories aim at operational optimization and continuous improvement seeks to automate the units. In 2022, Miguel Ángel Álvarez Parra carried out a study in which he proposed a cleaning and disinfection protocol in the poultry farms of the “Jehovah is my shepherd” company. The document expresses the importance of always having clean facilities under standards based on biosafety and equipment used by staff to prevent diseases in birds such as avian pox and reduce contamination through an environmental plaque study (Alvarez, 2022).

**Keywords**— Quality, Pig Farms, Maintenance.

## I. INTRODUCTION

In the layer poultry farms of the Cotaló parish of the Pelileo Canton, an investigation was carried out to determine the levels of biosecurity in all the company's farms and identify the strongest or weakest variables. Using descriptive statistics, good biosafety practices were evaluated with a survey-type instrument of 47 questions carried out by Agrocalid according to resolution 0260 with a score of 94 points and the results obtained were the classification of three strata with a range of 26-44%. Therefore, the operating permit is denied in stratum 1, the second stratum, with a low level of biosecurity falls in the range 26-44% where the operating permit was also denied and in stratum three, with a level of The average biosafety falls in the range of 45-59%, the operating permit is

granted with an established deadline to comply with 60% in the performance of appropriate conditions, hygienic and biosafety measures according to resolution 0260 (Montero,2019).

At the “Nuevo Amanecer” poultry company, an initial diagnosis of production was carried out, with the help of the Vester matrix, and biosafety protocols were applied, adapted to the needs of production, based on resolution ICA 3651 of 2014. Once finished, support was carried out within the production in pullets in the beginning and lifting stages, corrective actions were taken. The results obtained were the creation of a quality sanitary control with standards based on biosafety, through strict regulations the aim is to establish a quality product with the same live chicken weight (Castillo,2021).

Grupo Pecuario San Antonio has established itself as the main poultry company in southeastern Mexico, generating a great social and economic impact. Today its main objective is to provide its clients and strategic partners with the highest quality standards through a rigorous production, care and distribution process that manages to consolidate the best product on the market.

The focus of the project begins in the broiler chicken farms, which 49 days are for the fattening process, 2 days for extracting the manure, 2 days for cleaning, 2 days for disinfection and 7 days for sanitary vacuum with a total of 62 days in the process, focusing the project on the cleaning part, this distribution is of great impact because it is intended to reduce 1 day with the strategy to be implemented.

### OBJECTIVE

Reduce excessive use of water.

Reduce process time.

Increase product quality.

Reduce the number of people in the process.

### HYPOTHESIS

Automating the broiler chicken farms of the Grupo Pecuario San Antonio company will reduce water consumption and process time.

### JUSTIFICATION

Grupo Pecuario San Antonio has 12 farms, the growth environment of the birds depends on meticulous care of the health, cleanliness, population density as well as the supply of water, food, ventilation and nutrition of the birds.

The objective of this research project is to reduce the installation time of hydro washers. and the decrease in the amount of water used in the process.

## II. METHODOLOGY

In the field study, we work with quantitative variables, which allow us to identify the values that give rise to the automation of the washing process.

The project is divided into two stages:

Stage 1.- A study of the place will be carried out to consider the dimensions of the houses to take the measures to consider for the washing machine and not mistreat any component of the farm such as drinker and feeder lines.

Stage 2.- With the measurements obtained in stage 1, the design of the mini excavator with its storage tank and sprinkler system will be carried out using the design program.

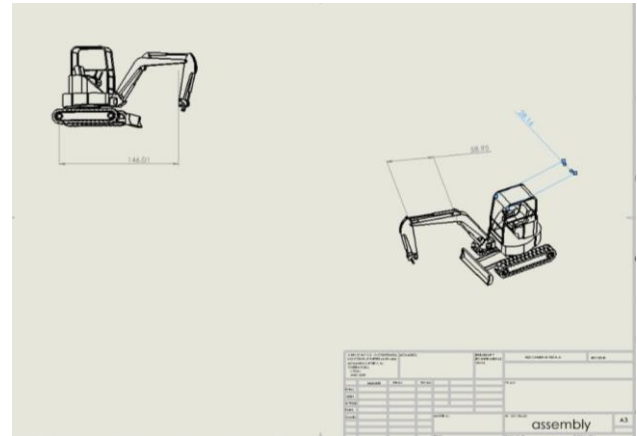


Illustration 1: Dimensions of mini excavator.

For the design of the machine, the location of the farms and the space between houses must be considered. The hoses that will be installed in the machine must provide greater water flow.

Development of the hydrostatic pressure:

DATA:

$H = 1\text{ m}$

$P = 997$

$G = 9.8\text{ m/}$

$Ph = (997)(9.8)(1\text{ m})$

$Ph = 9,770.6$

$Ph = 9,770.6\text{ Pa}$

$Ph = 9.7706\text{ Kpa}$

### DETAILED WET CLEANING PROCESS

1. Preparation of personnel: It consists of the poultry operator using personal protective equipment, gloves, mouth covers or mask, glasses or goggles.
2. Preparation of the dilution: Prepare the mixture for cleaning
3. Preparation of the lines: Check that the entire production line has liquid.
4. Draining: Drain the water lines and flush until the product passes through all the lines. When it reaches the last nipple, it must be closed to keep the liquid in the lines. The product must remain on the line for a minimum of 6 hours and a maximum of 24 hours.

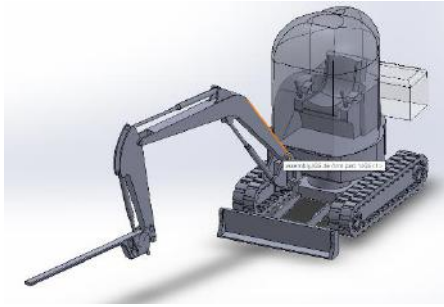


Illustration 2: pressure washer gun

As a result of the automation of the washing house, the cycle was reduced to obtain more tons of chicken,

Water consumption is reduced by 20%.

In addition, the mortality of poultry products is reduced by 5%.

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