Abdimas Umtas: Jurnal Pengabdian Kepada Masyarakat
LPPM-Universitas Muhammadiyah Tasikmalaya
Volume: 5 Nomor: 2
E-ISSN: 2614 - 8544

Application of Automatic Salt Packaging Technology to Increase Salt Production in the Minamas Pansela KUGAR Group Industry in Glempangpasir Village, Adipala District

Ria Manurung[1,a)], Agus Suparno[1)], Anastasia Febiyani[2)]

[1]Sekolah Tinggi Ilmu Komputer Yos Sudarso, Purwokerto, Indonesia
[2]Institut Teknologi Telkom Purwokerto, Purwokerto, Indonesia
Corresponding Author: ria.manurung74@gmail.com

Abstract

The functions and benefits of using an automatic salt-packing machine are an emergency button that functions as a helper in the event of an electrical short or interference with the temperature in the machine; a material made of stainless to avoid rust or corrosion, which generally occurs in iron, and this stainless material is not dangerous when packing salt products; a temperature controller with a sophisticated system that can work automatically and be adjusted according to the desired heat level. This Community Service Activity produces speeds up the salt packaging process; increases the number of salt processing results because machine capacity is large and automatic; Save production costs and time efficiency in the salt production process; Increase the tidiness of salt production because it can glue plastic so it does not penetrate air; increase the sales turnover of salt and safety for customers; modern automatic salt packaging machines are designed and built with functions that can help the KUGAR group to produce more salt production through the speed of the packaging machine so that salt production output will increase 100% in quantity. Problems in production by providing automatic salt packaging machine equipment to assist the salt production process at KUGAR MINAMAS PANSELA.

Keywords: Farmers, Crystallization, Tunnel, Plastic, Ocean

INTRODUCTION

Indonesia is a maritime country with the fourth longest coastline in the world, 95,181 km. This makes Indonesia rich in marine and fishery potential; salt is one of the sources of marine wealth. Salt is an important staple food for the community because it is used daily for both consumption and salting and for various foods and industrial needs (Dalimunthe, 2018). National salt demand from year to year continues to increase in line with population growth and the development of domestic industry, but national salt production has decreased. (Sofi et al., 2018).

The most significant decline in national salt production occurred in 2016, reaching 93.23% from 2.5 million tons to 168 thousand tons. In 2019, the national salt demand was estimated to increase by 5.98% to 4.2 million tons. Therefore, salt imports rose from 0.2% to 2.72 million tons. (Stelmasiak et al., 2019). Figure 1 shows a comparison chart of the needs, imports, and production of salt on a national scale.

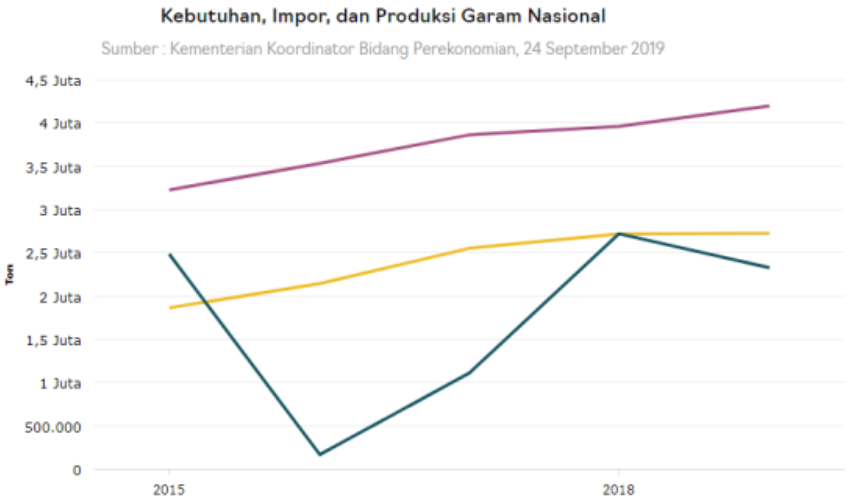

Figure 1. Demand, Import, and Production of Salt

Glempangpasir Village, Adipala District, Cilacap Regency, Central Java Province, is one of the centers for local-scale salt production. In the future, it will become a national scale. Salt farmers in this village have **implemented** the Tunnel system, the process of making salt that is carried out securely, starting from the natural water process from the sea to old water, which ends at the crystallization table (Dzikunoo et al., 2021). This system is proven to produce salt with better quality, white, and cleaner (Hao et al., 2021). Figure 2 is a salt farmer's pond with a Tunnel system. Figure 3 shows the results of the Tunnel system in the form of whiter and cleaner salt.

Figure 2. Salt Pond with Tunnel System

Figure 3. Salt Results from the Tunnel System are whiter and cleaner

Salt farmers in Glempangpasir Village collect seawater by drilling wells on the beach (figure 4), then the water enters the reservoir and passes through the filter in figure 5. The filtering contents in the container consist of solid rock, charcoal, and filter cloth. Next, the water enters the washing tank I (3 BE - 7 BE). Then it flows into tub II (7º BE – 12 BE). After the water reaches (12º BE - 17 BE), it flows **into** tub III. If the water has reached (17º BE - 23 BE), it flows into tub IV and the finishing tub when it reaches (23º BE - 25 BE) until the water starts to crystallize. Degree BE or Baume is a scale for measuring the density of liquids heavier than water and other scale tools. (Besttekin, 2017). The processing of seawater into the salt with the Tunnel system is faster than with other systems because it takes about 28 days when it is the rainy season. However, the salt harvest can be even faster in the dry season, around 15-20 days (Joesidawati, 2019).

Figure 4. Salt Raw Materials from Underground Wells

Figure 5. Water Reservoir for Salt Raw Materials

Ready-to-eat salt from Glempangpasir Village is called Minamas Pansela salt. The name salt is taken from the People's Salt Business Group (KUGAR) MINAMAS PANSELA, which is chaired by Mrs. Sarti Rahayu Pujianingsih and consists of 13 people. This group was established in 2016 starting from a BUMDES administrator, Mrs. Sarti, who is looking for village potential as an object of activity in one of the business units. Realizing that Glempangpasir Village is located in the south coast area, which has an unlimited wealth of seawater, especially as raw material for salt, Ms. Sarti thought about and sought information from various parties on how the seawater can be processed and valuable (Fougy et al., 2016). Through a long process and after this group proposed to the Central Marine and Fisheries Service, it continued with the construction of salt ponds with a tunnel system (Gudjónsdóttir et al., 2011).

Partner Problems

The salt packaging process, which is still manual with a simple plastic adhesive sealer equipment and a small tool, requires several people's labor because it must be put into plastic, then weighed first, then clamped with these simple tools (Bryła, 2020). The workforce required is usually three people or at least two people so that the work can be completed correctly, and it takes a long time because everything is manual. The wrapper often leaks because the results of adhesive clamps are not strong or not tight (Wang et al., 2020).

METHOD

Problems in production by providing automatic salt packaging machine equipment to assist the salt production process at KUGAR MINAMAS PANSELA. The working principle of the packaging machine equipment is as follows:

- Turn on the automatic salt-packing machine
- Setting the plastic roll in the space provided
- Setting the packaging temperature according to the type of plastic used
- Enter the raw salt material to be packed in the funnel of the salt packing machine
- Press the start button on the control panel to start the product packaging process
- Next, the salt product will be packed automatically
- The product packaging results will come out in the available place
- Stop the machine by pressing the button on the control panel provided when the packaging process is complete.

The Community service team will also conduct training for the use of salt packaging machine equipment and the operation of salt production equipment. The training was given in the form of demonstrations on the equipment operation by the Team to partners and continued with practice by KUGAR Minamas Pansela participants until the KUGAR Minamas Pansela partners could

operate the equipment. Likewise, for the maintenance of the machine tools. This training aims to enable KUGAR Minamas Pansela partners to improve their production processes' performance by using salt packaging production equipment infrastructure supported by modern technology (Nechita et al., 2015).

RESULTS AND DISCUSSION

The following is a modern automatic salt-packing machine.

Figure 6. Modern Automatic Salt Packaging Machine

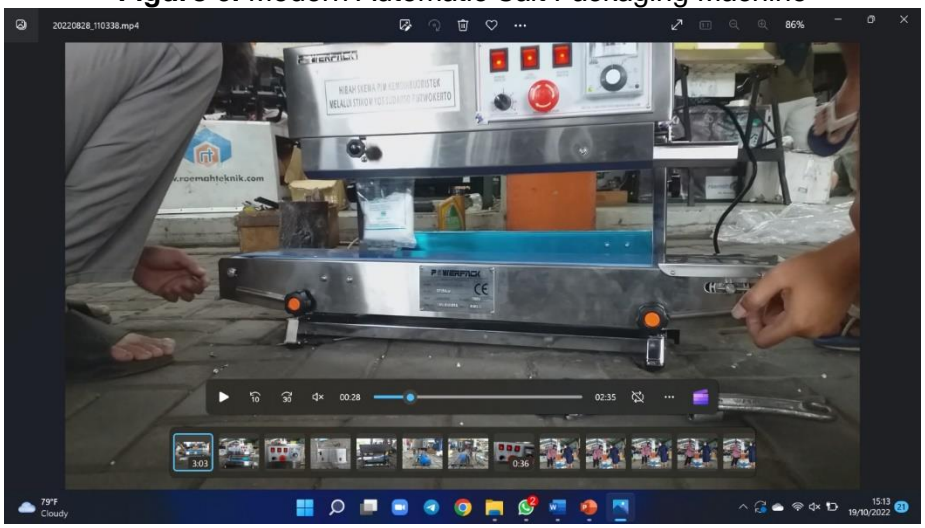

Figure 7. Modern Automatic Salt Packaging Machine

Specifications of Modern Automatic Salt Packaging Machine

- Vibration drop filling model (vertical)
- Filling size 100-500 grams
- Filling accuracy 1 gram
- Filling speed 15 – 20 pcs per minute
- Machine Material Stainless steel
- Volt AC 220V 50Hz
- Film type plastic bag, Tea bag
- Seal type Back Seal Pillow (BS)
- Power 900 w
- Dimensions or sizes 460 x 590 x 1400 mm

The functions and benefits of using an automatic salt-packing machine are:

- Has an emergency button that functions as a helper in the event of an electrical short or interference with the temperature in the machine. This button works because when a temperature disturbance occurs, it will immediately return to normal, and the machine will turn off automatically. So, there is no need to worry about electrical disturbances that can cause fires.
- Has a material made of stainless to avoid rust or corrosion, which generally occurs in iron, and this stainless material is not dangerous when packing salt products (Noordin et al., 2014).
- It Has a temperature controller with a sophisticated system that can work automatically and be adjusted according to the desired heat level. There is no need to worry about the temperature being too hot and the usage being too dispersed because the machine has an automatic temperature controller that can neutralize and has a conveyor speed.
- Able to pack various sizes and packaging models as needed (Tan et al., 2019).
- Speeding up the salt packaging process, increasing the number of salt processing results, saving production costs and time efficiency in the salt production process, and increasing the tidiness of salt production because it can glue plastic, so it doesn't penetrate the air (Chen et al., 2020) .

CONCLUSIONS AND RECOMMENDATIONS

This Community Service Activity produces:

- Speed up the salt packaging process
- Increase the number of salt processing results because the machine capacity is large and automatic
- Save production costs and time efficiency in the salt production process
- Increase the tidiness of salt production because it can glue the plastic so it does not penetrate the air.
- Increase sales turnover of salt and safety for customers
- Modern automatic salt packaging machines are designed and built with functions that can help the KUGAR group to produce more salt production through the speed of the packaging machine so that the salt production output will increase 100% in quantity or quantity.

ACKNOWLEDGMENT

Thanks to KEMDIKBUDRISTEK for the PIM grant approved to be funded, LPPM STIKOM Yos Sudarso Purwokerto and the People's Salt Business Group (KUGAR) Minamas Pansela in Glempangpasir Village, Adipala District.

REFERENCES

Bryła, P. (2020). Selected predictors of the importance attached to salt content information on the food packaging (A study among polish consumers). *Nutrients*, *12*(2). https://doi.org/10.3390/nu12020293

Chen, Y. wen, Cai, W. qiang, Shi, Y. gang, Dong, X. ping, Bai, F., Shen, S. ke, Jiao, R., Zhang, X. yu, & Zhu, X. (2020). Effects of different salt concentrations and vacuum packaging on the shelf-stability of Russian sturgeon (Acipenser gueldenstaedti) stored at 4 °C. *Food Control*, *109*. https://doi.org/10.1016/j.foodcont.2019.106865

Dalimunthe, H. (2018). The Effect of Leadership Style and Work Motivation on Employee Performance in Salt Packaging Business. *Jurnal Konsep Bisnis Dan Manajemen*, *5*(1).

Dzikunoo, J., Letsyo, E., Adams, Z., Asante-Donyinah, D., & Dzah, C. S. (2021). Ghana's indigenous food technology: A review of the processing, safety, packaging techniques and advances in food science and technology. In *Food Control* (Vol. 127). https://doi.org/10.1016/j.foodcont.2021.108116

Fougy, L., Desmonts, M. H., Coeuret, G., Fassel, C., Hamon, E., Hézard, B., Champomier-Vergès, M. C., & Chaillou, S. (2016). Reducing salt in raw pork sausages increases spoilage and

correlates with reduced bacterial diversity. *Applied and Environmental Microbiology*, *82*(13). https://doi.org/10.1128/AEM.00323-16

Gudjónsdóttir, M., Lauzon, H. L., Magnússon, H., Sveinsdóttir, K., Arason, S., Martinsdóttir, E., & Rustad, T. (2011). Low field Nuclear Magnetic Resonance on the effect of salt and modified atmosphere packaging on cod (Gadus morhua) during superchilled storage. *Food Research International*, *44*(1). https://doi.org/10.1016/j.foodres.2010.10.029

Hao, S., Wang, Y., Yan, Y., Liu, Y., Wang, J., & Chen, S. (2021). A review on plant responses to salt stress and their mechanisms of salt resistance. In *Horticulturae* (Vol. 7, Issue 6). https://doi.org/10.3390/horticulturae7060132

Nechita, P., Bobu, E., Parfene, G., Dinicə, R. M., & Bəlan, T. (2015). Antimicrobial coatings based on chitosan derivatives and quaternary ammonium salts for packaging paper applications. *Cellulose Chemistry and Technology*, *49*(7–8).

Noordin, W. N. M., Shunmugam, N., & Huda, N. (2014). Application of salt solution and vacuum packaging in extending the shelf life of cooked fish balls for home and retail uses. *Journal of Food Quality*, *37*(6). https://doi.org/10.1111/jfq.12105

Sofi, S. A., Singh, J., Rafiq, S., Ashraf, U., Dar, B. N., & Nayik, G. A. (2018). A Comprehensive Review on Antimicrobial Packaging and its Use in Food Packaging. *Current Nutrition & Food Science*, *14*(4). https://doi.org/10.2174/1573401313666170609095732

Stelmasiak, A., Wyrwisz, J., & Wierzbicka, A. (2019). Effect of packaging methods on salt-reduced smoked-steamed ham using herbal extracts. *CYTA - Journal of Food*, *17*(1). https://doi.org/10.1080/19476337.2019.1660409

Wang, L., Gu, Y., Li, Y., Ruan, J., Lü, S., Shen, D., Long, Y., & Kong, Q. (2020). Effect of packaging manners on industrial waste salt landfill process. *Huanjing Kexue Xuebao/Acta Scientiae Circumstantiae*, *40*(3). https://doi.org/10.13671/j.hjkxxb.2019.0463