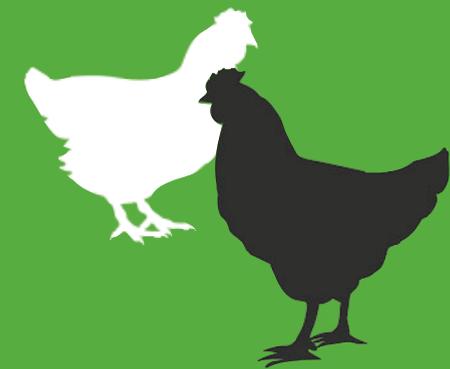


Exploring the benefits of an egg palletising Robot focussing on health and safety for the egg producer

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Farming Connect - Projects in practice



The project

With over 40,000 eggs to be collected daily there was pressure of resources and especially labour to complete the task effectively and efficiently.

The original method to collect eggs out of the shed was by hand. Two people would be required to grade the eggs and stack them onto the pallet for collection. The project aimed to compare manual packing to the system which mechanically stacked the egg trays.



The farm

Hywel and Rachel Davies farm sheep, beef and poultry at their home farm near Newtown in Mid Wales. They diversified into the poultry egg sector in 2008 constructing a laying unit to house 16,000 chickens, they have since expanded and the farm currently houses 42,000 birds, the eggs from which are packed in a central packing room within the original chicken shed.

Business aspirations:

To increase efficiency and profit from the farm and secure a sustainable future for the business.



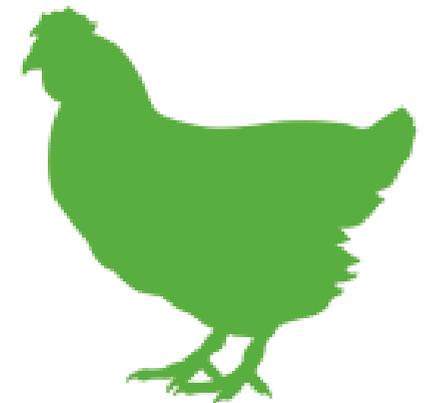
The project

Shaun and Brian are employed at Genauhafod and work daily between the hours of 8:00 and 12:00. In the interest of bird health and biosecurity both Shaun and Brian only walk one of the sheds each. When walking through the birds they carry out daily husbandry checks, collect floor eggs and any dead or unwell birds. Alongside walking the sheds, packing the eggs is a crucial role for any egg producer and within many systems requires a high proportion of the workforces' time.

The time requirement for packing eggs was therefore recognised as somewhere efficiencies could be improved to better utilise the labour resource. An egg palletising robot was seen as an opportunity to reduce the labour requirement and was introduced to Genauhafod's egg packing system.

An assessment was carried out which compared the robotic egg palletiser with the previous system of manually packing the eggs. The assessment found that even though the robotic system was capable of high speeds the actual time taken to stack the eggs was limited by the speed of the egg belt delivering the eggs to the collection room and the time taken to manual grade eggs was dependent on the worker. In Genauhafod's system a pallet holding 720 dozen eggs requires 45 minutes to correctly stack, with over 4.5 pallets filled with eggs per day the complete time required to pack the eggs was close to 2.5hrs per day. The egg palletiser reduced the need for two people to pack the eggs meaning that one person was capable of packing eggs in the same time which previously would require two people.

The project also aimed to investigate the health impacts of manually stacking eggs and how this could potentially impact on the workers well-being. An Assessment of Repetitive Tasks of the upper limbs (ART) and a Manual handling assessment (MAC) were completed to assess any health and safety benefits from using the egg palletising robot. The assessments found that the robot reduced any heavy lifting elements of the task by reducing the lifting operations involved when placing the egg stacks on the pallet.



Production benefits

The egg palletising robot does not directly impact on the bird's egg production. However, the robot provides the opportunity for the workforce to better utilise and spend time on husbandry tasks overseeing the birds which could potentially improve production and bird health and welfare.

Management benefits

"The egg palletising robot has allowed for more flexibility in the workforce making better use of our assets and workforce". With the assistance of the robot, egg packing requires only one person which allows the other to complete separate tasks. The working day routine has changed since having the robot. Shaun and Brian will begin work at 8am, while the one starts the day by walking their shed the other can begin collecting eggs from the egg belt as the robot stacks the eggs onto the pallet. Once the one shed has been walked they swap tasks meaning that the other will walk the other shed maintaining biosecurity and providing continuity for the birds. "For us it is important that the birds are inspected by those who they are familiar with and whom will be able to notice the slightest difference in the bird's environment".

The robot makes it easy for one person to collect the eggs allowing for the daily task to be completed quickly and efficiently. "It also means that they are not reliant on each other and do not rush walking the birds in order to return to the egg room to stack the eggs".

Health and Safety benefits

The health and safety assessments completed as part of the project show that there are a number of repetitive tasks involved with the work. Without the use of the robot the workforce is required to frequently lift objects over a weight of 10kg whilst in awkward positions. The robot reduces the requirement to lift this weight and minimises the bending into awkward positions.

The assessment of repetitive tasks of the upper limbs tool was used to assess the pressures on the body from work related tasks. The assessment identified an exposure score of 16.5 for the left hand and 11.25 for the right hand. The left-hand score of 16.5 is considered medium exposure level and further investigation is required. The right-hand score of 11.25 is considered low exposure level and individual circumstances should be considered. The score for the assessment of repetitive tasks is the same for both working with the robot or without the robot.

The manual handling assessment charts were used to assess the pressures on the body from work related tasks. This assessment was only applicable to the lifting operations of stacking eggs without the use of the robot due to no lifting of over 10kg with the use of the robot. The assessment showed that there were areas of high levels of risk, medium levels of risk and low levels of risk when stacking the trays of eggs manually. High levels of risk were found from torso twisting and sideways bending. With regards to this movement action is required to reduce the level of risk and there is significant risk of injury to the proportion of the workforce. Where areas have been associated as medium level of risk it is advised to examine the tasks closely and consider the level of risk the workforce is exposed to.

Labour benefits

The project found that the egg palletising robot saves 2.5 hours per day labour requirement. The minimum hourly rate for agricultural workers is £7.51. Meaning a minimum saving of £18.78 per day and £6,852.88 annually. For Genuahafod's system through labour saving alone the robot would pay for itself within 4.38 years and after this time saving the business a minimum of £6,852.88 annually at the current agricultural minimum wage.

Quotes of egg stacking machines on the market

RM Group Egg Palletiser	£30,000
Prinzen COBOT Pallister	£29,950
Techno Egg Palletiser	€32,000 (£28,001.90 at current exchange rate May 2018)

Costs

Details	Cost	
Egg stacking	£30,000	
Benefits	Benefits within 12 months	Benefits within 5 years
Benefit of 2.5hrs per day. Minimum hourly rate £7.51 @ 362 days	£6,852.88	£34,264.40

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