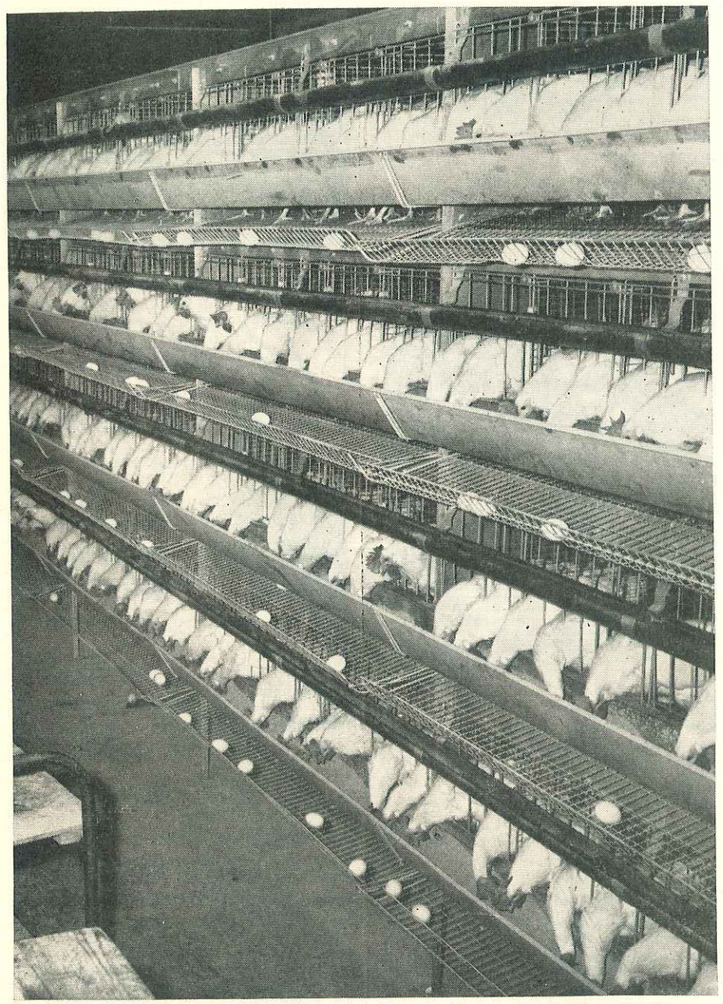
How the British Automate Laying Cage Operations

British poultrymen are shaving housing costs for caged layers by building multi-tiered cages and are cutting labor expense by automating manure disposal, feeding, watering, and, in some cases, even egg collecting.



Multi-bird cages four tiers high make the laying cage system in Britain more economical, space-wise, than floor laying houses. The cages hold three or four pullets.

● Many aspects of present-day poultry operations in the United Kingdom have been closely modeled on the American pattern, a fact which British poultrymen have no reservations about acknowledging. An exception, however, is the cage system of egg production which has developed along completely individual lines.

The basic reason for this is Britain's insular-type of climate — cool and damp for most of the year, with summer temperatures rarely exceeding 70 degrees F. (21 degrees C.).

Successful egg production in such conditions demands a high degree of environment control in the laying house. Roofs and walls must be thermally insulated to a U value of less than 0.25 and powered ventilation is essential. In addition, most of Britain's eggmen like to use artificial light to stimulate production.

Housing which satisfies these requirements is, of course, costly and can only be an economic proposition if every square foot of floor space is utilized to the fullest extent.

Result: In contrast with American designs, British cages are never less than three tiers high and increasing numbers of producers are adopting four-tier blocks.

Since most cages are of the multi-bird type, layers can be accommodated at less than ½ square ft. (.15 square m.) per bird. Cost-wise, this compares very favorably with any floor system of egg production. The combined expense for house and three-bird cages amount to about $3 per head, while a house and 20-bird colony cages can be erected for only $2.30 per bird.

Manure Disposal

Such a fundamental difference in design requires a different management technique. Manure disposal is an example. It is impossible for droppings from all tiers of cages to fall directly on the floor of the house. Instead, a solid base for droppings is fitted under each row of cage floors. Because space is too limited for an accumulation of manure, cleaning is necessary at frequent intervals.

The system adopted by the majority of manufacturers is a 3-inch (7.6 cm.) deep droppings channel running the length of the cage block under each tier. The base of the channel is made of galvanized metal or reinforced glass and is cleaned by a scraper blade operated by a winch at the end of the cage block.

The tiers can be individually cleaned by manual winch operation, but in most cases the winches are geared together so that all tiers can be scraped simultaneously by manual or motorized control. A big build-up of manure would strain the equipment, so the channels are normally cleaned at least once a day.

Another system which is popular employs movable wire netting under each row of cages. Expendable waterproof paper is laid on top of the wire where the droppings accumulate.

Once every five to seven days the wire is moved on rollers so that the paper, loaded with manure, travels to the end of the cage block and falls off into a bin, wheelbarrow or trolley. Clean paper automatically replaces the old paper.

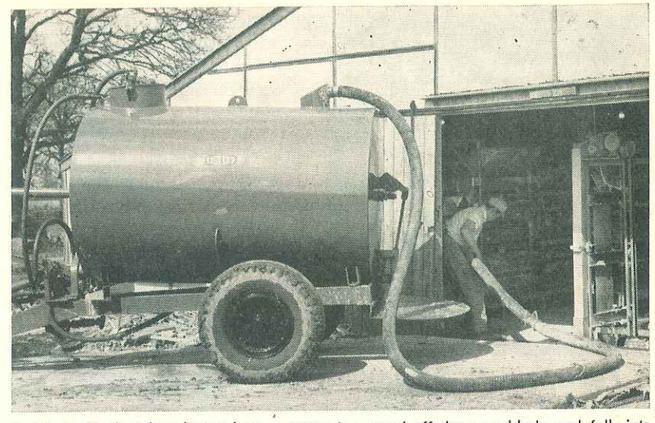
A third cleaning system incorporates endless belts, made usually of polythene-coated nylon, which run under the floors between rollers at the ends of the cage block. Droppings deposited on the belt fall off into receptacles at one end of the block. At the other end, the belt runs through a tank of detergent solution where brushes automatically clean off any manure residue.

To save labor, all three systems are normally operated automatically by electric motors controlled by a time switch. Cleaning can therefore be done frequently and economically to reduce pollution of the house atmosphere by odors and evaporating moisture from the droppings.

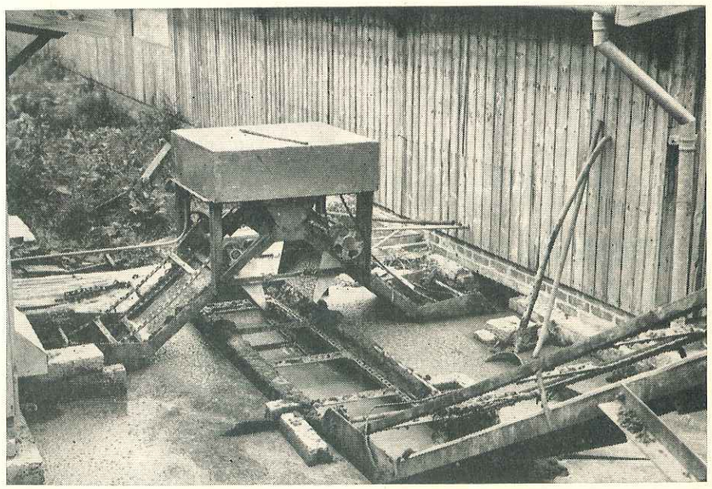
Manure is removed from the house in two ways. Some producers install a scraper-conveyor in an underfloor gutter which runs beneath the ends of the cage block. The conveyor is connected to an elevator outside the house which dumps the manure on a heap. The accumulated manure is cleared every six months or so by a tractor and manure spreader.

The second method, more popular because it is less costly, employs an underground storage tank, located directly under the ends of the cage block or outside the house. In the latter case, manure flows to the pit

On this Hampshire egg farm, feeding 10,000 layers takes the operator exactly ten minutes a day. He fills the traveling hoppers, pushes a button, and the correct amount of feed is automatically distributed to every cage.



In this Buckinghamshire laying house manure is scraped off the cage blocks and falls into an underground storage tank. Once a month the pit is emptied by a vacuum tanker (shown above) and the effluent spread on pasture.



Mechanical conveyors on this Kent farm carry the manure from the cages in two 5,000-bird houses to an elevator which lifts the manure onto a storage heap. The heap has a roof over it to keep out rain and to permit the manure to dry for spreading.

along a gutter, often propelled periodically by water under pressure.

In the pit, the droppings are diluted with water to form a semi-liquid sludge. The sludge is either pumped out into an irrigation system or, more often, sucked out by a vacuum tanker which carts the manure away and spreads it on pasture.

How often emptying is necessary depends upon the size of the storage pit.

To avoid the high cost of fitting electric motors to all 20 blocks of laying cages on this Berkshire farm, a mobile drive unit is employed. It can be moved and fitted to each block to operate the mechanical feeding and cleaning system.

A monthly clean-out demands a capacity of about ½ cubic ft. (.014 cubic m.) per bird.

Feeding

Although one manufacturer in England has adapted a floor-type, chain-driven, mechanical feeder for use with laying cages, the majority employ a much simpler system of traveling hoppers.

Each tier of cages is fitted with continuous troughing running the whole length of the block of cages. Hoppers travel slowly along the cages depositing feed inside the troughs. The level of feed deposited can, by adjusting the hoppers, be preset to any depth, to coincide with the feed intake of the pullets and the interval between operations.

Usually the feed hoppers are mounted on a motor-driven traveling framework which also incorporates a scraper-cleaning mechanism.

Such an arrangement permits three or four thousand cage layers to be fed and the feeding trough cleaned at the touch of a button. The operator's only chore is to fill the hoppers with feed each morning from the nearby bulk storage bin outlet pipe.

Watering

For many years watering has been on the drip-feed principle, each trough having an overflow pipe at the end to remove surplus water to a drain or to an underground manure pit.

But in recent months British producers have increased their use of droplet drinkers. Droplet drinkers are stainless-steel, nipple-shaped valves set into polythene piping which runs through the cage blocks. The birds peck at the nipples to release one drop of water at a time.

Several advantages are claimed for this system over conventional drinking troughs. They include: No feed wasted in the drinking water; no cleaning; and no water spillage into the feed troughs.

Egg Collecting

Egg collection is the chore which has defied successful automation for the longest time. Early experiments showed that, although a mechanical collector could pick up 1,000 eggs in 10 minutes, compared with the 45 minutes required for manual gathering, the increase in egg damage made mechanical collection an uneconomical proposition.

So nine operators out of every ten still gather by hand, packing the eggs directly into filler trays on a trolley.

But one mechanical system shows promise. It is incorporated on the feed hopper framework and involves the use of special cage floors with hinged fronts. As the device travels along the cages, cams open the hinged floor fronts and release the eggs into a holding tray.

The ingenuity which has been shown in automating laying cages in Great Britain, at a time when labor is becoming both costly and scarce, has significantly boosted the cage system's appeal to egg producers. It is not unusual to find a unit of over 12,000 caged layers managed by one girl. Many producers have been able to reduce their chores to a mere ¾-hour a day per 1,000 birds, which represents a labor cost of only .88 cents per dozen eggs. — *Anthony Phelps*