Cage Layers May Be Drinking Too Much

● If you squeezed all the water out of a laying hen, she would weigh less than half as much as she does normally. Water is an important physical component of body tissue cells and, in addition, plays many other vital roles in maintaining a hen's life, health and production.

Water is needed, for instance, to perform essential physiological functions like softening food particles, dissolving their nutrients, and carrying them to various parts of the body. It takes part in chemical processes involved in producing energy and growth, and acts as a means of transport for waste products.

Water is a lubricant for the joints of the body, a cushion for the body organs and the embryo in an egg, and it constitutes about two-thirds of the weight of every egg laid. Water is also the primary means of controlling the hen's body temperature, even though she does not have sweat glands. In hot weather nearly half the water she drinks is evaporated through the respiratory system, and excess body heat is dissipated with the water vapour.

Where manure accumulates on the floor under cages, excessive drinking causes it to spread outwards in an oozy mess into the passages unless sawdust is put down to absorb the moisture.

Need To Drink Plenty

Translated into elementary practical terms, all this means that the laying hen needs to drink plenty (especially in a hot environment) if her body is to function properly and if she is to produce eggs economically. In fact, she needs to drink more in proportion to her size than a high-yielding dairy cow.

This has always been interpreted as indicating the need to give hens unrestricted access to water, to allow them to adjust their intake according to their changing physiological and productive requirements. Recently, however, this assumption has been questioned, upon evidence that layers often drink more water than they really need.

Excessive water intake is most marked when environmental temperatures are high. During research conducted by the US Department of Agriculture, hens maintained in an ambient temperature of 18°C drank only two kilos of water for each kilo of food consumed. But when the environmental temperature was raised to 35°C, water intake soared to 4.7 kg per kilo of food.

Scientists have calculated that the higher rate of liquid intake is more than 2½ times the quantity required to produce 250 eggs per bird in a year. And they say the increase of 2.7 kg of water per kilo of food is far greater than the body's cooling mechanism needs to cope with a 17°C rise in ambient temperature.

Prevalent In Cages

Over-consumption of water is especially prevalent among layers in cages. This is reflected in the looseness of their droppings. At West Virginia University, USA, the average moisture content of fresh cage manure was found to be 74.35% compared with 70.35% in manure from the droppings pit of a floor laying house.

A likely reason for this is the very close proximity of caged layers to their water supply. They do not have to walk long distances to find water, as they would have to on deep litter—it is never more than a few centimetres away. Couple this ready accessibility with the boredom of close confinement, and heavy drinking probably seems an enjoyable way to pass the time. In similar circumstances, many poultrymen would do the same.

Some scientists believe cage layers may drink twice the amount of water they need at times of high environmental temperature. This is supported by the findings of the USDA researchers. They report that caged hens at 18°C excreted 1.5 kg of manure for each kilo of food eaten, but at 35°C the figure rose to 2.6 kg of

In systems where the manure is conveyed out of the house by belt, it is essential that droppings remain dry and this spells the need to restrict water intake in hot weather.

manure per kilo of feed.

The extra weight was simply water surplus to the needs of the birds' cooling mechanisms. Does this excessive intake of water have any harmful effects?

One American scientist has answered this by saying, "When hens drink all day in warm weather they become water-logged and do not digest their feed properly." In other words, excessive intake of water speeds the passage of food through the body, diluting the gastric juices and giving the digestive system less time in which to extract nutrients.

Feed Economy Suffers

Result: food conversion efficiency suffers, which raises the cost of producing eggs. Additionally, sloppy droppings present several management problems.

Sloppy manure can give off very objectionable odours, attract flies and other insects and provide ideal conditions for their proliferation. In houses where manure accumulates on the floor under the cages, it spreads outwards as an oozy mess

E' Probabile Che Le Ovaiole In Gabbia Bevano Troppo

Riassunto—Le ovaiole necessitano di un adeguato rifornimento d'acqua, ma recentemente è stato messo in evidenza che esse bevono di più di quello che occorre loro durante la stagione calda. Nel corso di ricerche condotte dall'USDA, le galline mantenute in un ambiente a temperatura di 18°C hanno bevuto solo 2 kg. di acqua per ogni kg. di mangime consumato. Ma quando la temperatura ambientale è stata elevata a 35°C il consumo d'acqua è aumentato fino a 4,7 kg. per kg. di mangime.

Gli scienziati hanno calcolato che la maggiore percentuale di assorbimento liquido è più di 2½ la quantità richiesta per produrre 250 uova per animale in un anno. Il super-consumo di acqua è particolarmente prevalente fra le ovaiole in gabbie. Questo si riflette nella mollezza delle loro feci, avendo una media del contenuto di umidità nella pollina fresca di gabbia del 74,35% a paragone con il 70,35% nelle feci del pozzetto di un capannone da deposizione su lettiera.

Uno scienziato Americano ha dichiarato "Quando le galline bevono tutto il giorno con la stagione calda esse diventano gonfie di acqua e non digeriscono bene il loro mangime". Risultato: viene a soffrirne l'efficienza della conversione del mangime, la quale aumenta il costo della produzione delle uova. Inoltre le feci umide presentano svariati problemi di smaltimento.

Tali problemi hanno portato gli scienziati a raccomandarsi di impedire alle ovaiole in gabbia un super-consumo d'acqua. Un sistema pratico è quello di imporre alcune restrizioni alla disponibilatà d'acqua delle ovaiole in gabbia—fornendo l'acqua sufficiente alle loro esigenze fisiologiche e produttive ma non di più. Questo è stato tentato sperimentalmente e ha ottenuto come risultato un significativo miglioramento dell'efficienza dell'utilizzazione del mangime e dello stato delle feci senza danneggiare la produzione delle uova.

Presso la Stazione di Sperimentazione Agricola di Auburn negli USA, alle ovaiole in gabbia è stata data acqua per periodi di 15 minuti ad intervalli di un'ora, due ore, e tre ore. La produzione delle uova dai gruppi razionati non ha mostrato nessuna significativa differenza a paragone con la produzione degli animali "controllo" riforniti continuamente d'acqua.

Presso la Stazione Sperimentale Agricola di Florida, USA, alle ovaiole in gabbia è stato effettuato un razionamento di 2 ore d'acqua per due volte al giorno, alle 8 e alle 16,30. La produzione delle uova non è stata influenzata dalla restrizione dell'acqua, ma il consumo di mangime è stato significativamente ridotto. La mortalità era più bassa con il regime ad acqua razionata il quale ha anche procurato un piccolo miglioramento della qualità interna delle uova, e una sostanziale riduzione del contenuto di umidità della pollina.

Il Se Pourrait Que Les Pondeuses En Cages Boivent Trop

Sommaire—Il faut donner suffisamment d'eau à des pondeuses, mais récemment on s'est aperçu que par temps chaud, elles buvaient souvent plus que ce n'était nécessaire. Pendant des expériences faites par l'USDA, des poules placées dans une température ambiante de 18°C ont bu seulement 2 litres d'eau par Kilo de nourriture consommée. Mais quand la température a été élevée à 35°C, les poules ont bu 4,7 litres d'eau par kilo de nourriture.

Des savants ont calculé que cette quantité d'eau consommée était deux fois et demi supérieure à ce qu'il fallait par bête pour pondre 250 oeufs par an. Cette consommation excessive d'eau est surtout vraie chez les pondeuses en cages. On la retrouve dans l'aspect liquide de leurs déjections le taux moyen d'humidité étant de 74,35% alors qu'il n'est que de 70,35% dans la fosse d'un poulailler de ponte au sol.

Un savant américain a dit: "Quand les poules boivent toute la journée par temps chaud, elles s'imbibent d'eau et ne digèrent plus correctement leur nourriture". Résultat: l'efficacité du taux de conversion en souffre ce qui augmente le coût de production des oeufs. En plus, les déjections liquides posent des problèmes particuliers.

Tous ces problèmes ont conduit les savants à recommander que l'on em-

into the passages between the stacks.

Wet droppings are both difficult and unpleasant to clean out. They increase the amount of moisture which has to be extracted through the ventilation system of the building. And by soiling the cage floors they lead to an increase in the number of dirty eggs.

All these problems have led scientists to recommend that, in some way or another, cage layers should be deterred from over-consuming water. One proposal for curing "aquaholism" put forward by a professor at the University of Pennsylvania, USA, is to taint the water supply with some substance which has an unpleasant flavour.

His research shows that, in terms of taste, a chicken's sensitivity to liquids is 10 times as great as to solid foods. In experiments he has conducted, cage hens have shown an active dislike to the substance xylose, which is unpalatable but completely non-toxic.

This sort of approach to the problem of heavy drinking may produce satisfactory results in the laboratory, but there are strong arguments against its application to commercial layer management. The two main objections are (1) The investment cost of the necessary metering equipment and the recurring cost of adding xylose to the water. (2) The risk, through human or mechanical error of making the water too unpalatable and deterring the hens from drinking as much as they need for

The main causes of overconsumption of water in cages are boredom and the proximity of the drinkers. The problem is most serious with open troughs and running water.

pêche les pondeuses en cages de consommer trop d'eau. Une façon concrète d'y arriver est de diminuer la quantité d'eau mise à la disposition des pondeuses en cages—fournir suffisamment d'eau pour leurs besoins physiologiques et de production mais rien de plus. Expérimentalement ceci a été essayé et on obtenu de nettes améliorations dans l'efficacite du taux de conversion alimentaire et l'état des déjections sans pour cela gêner la production.

Al la Station Expérimentale Agricole d'Auburn aux Etats Unis, on a donné à boire à des pondeuses en cages pendant 15 minutes toutes les heures, deux heures et trois heures. On n'a pas trouvé de différence significative dans la production d'oeufs des poules limitées en eau par rapport à celles qui ne l'étaient pas.

A la Station Expérimentale Agricole de Floride aux Etats Unis, on a laissé boire les pondeuses en cages pendant deux heures et deux fois par jour à 8 heures du matin et 16 heures 30. La production d'oeufs n'a pas souffert des restrictions en eau, mais la consommation alimentaire a été sensiblement réduite. Avec la formule de limitation d'eau, on a aussi observé une mortalité moins forte, une amélioration des qualités internes de l'oeuf et une réduction substantielle du contenu en eau des déjections.

Käfighennen verzehren möglicherweise zuviel Trinkwasser

Zusammenfassung—Legehennen müssen mit Trinkwasser ausreichend versorgt werden; jüngste Forschungsergebnisse, vom US-Landwirtschaftsministerium durchgeführt, lassen jedoch vermuten, daß Hennen unter warmen Wetterverhältnissen mehr Trinkwasser verzehren als sie benötigen. Bei 18°C. Umwelttemperatur tranken Hennen nur 2 kg Wasser/1 kg Futterverzehr. Bei Steigerung der Umwelttemperatur auf 35°C. stieg dieser Wert auf 4,7 kg Wasser/1 kg Futter an.

Wissenschaftlichen Berechnungen zufolge entspricht dieser Flüssigkeitsmehrverzehr der über zweieinhalbfachen Menge, die erforderlich ist, um 250 Eier/Henne/Jahr zu produzieren. Trinkwasserüberverzehr herrscht vor allen Dingen bei Käfighennen vor. Dies zeigt sich durch wenig festen Kot (durchschnittlicher Frischkotfeuchtigkeitsgehalt von 74,35% verglichen mit 70,35% Bodenhaltung).

Dazu ein amerikanischer Wissenschaftler: "Wenn Hennen bei warmen Wetter den ganzen Tag trinken, "durchweichen" sie sich selbst und beeinträchtigen den Verdauungsprozess. Das Resultat: die Futterverwertung leidet, womit die Eierproduktionskosten steigen. Außerdem führt Kot schlechter Konsistenz zu verschiedenen Haltungsproblemen."

Diese Probleme haben Wissenschaftler zu der Empfehlung veranlaßt, daß man Käfighennen von Trinkwasserüberverzehr abhalten sollte. Am einfachsten erreicht man dies dadurch, daß man die Wasserverfügbarkeit einschränkt und nur soviel Wasser bietet, um den physiologischen und produktiven Bedarf zu decken. Im Experiment hat man dies versucht und damit ohne Beeinträchtigung der Legeleistung signifikante Verbesserung der Futterverwertung und des Kotzustandes erreicht.

Auf der landwirtschaftlichen Versuchsstation Auburn, USA, erhielten Käfighennen in Zeitabständen von einer Stunde, zwei Stunden bzw. drei Stunden 15 Minuten lang Trinkwasser vorgesetzt. Die Legeleistung dieser restriktiv gehaltenen Gruppe zeigte gegenüber kontinuierlich getränkten Kontrollhennen keinerlei signifikanten Unterschiede.

An der landwirtschaftlichen Versuchsstation Florida, USA, limitierte man Käfighennen auf eine zweimal tägliche Trinkperiode von 2 Stunden—beginnend om 8 Uhr vormittags und 4.30 Uhr nachmittags. Die Trinkwasserrestriktion beeinträchtigte die Legeleistung nicht, reduzierte aber den Futterverzehr erheblich. Bei der Gruppe mit restriktiver Trinkwasserzuteilung zeigten sich ebenfalls niedrigere Mortalität, eine leichte Verbesserung der inneren Eiqualität und eine erhebliche Reduktion des Kotfeuchtigkeitsgehalts.

maximum egg output.

A more practical approach is to impose some restriction on the availability of water to caged layers—providing enough water for their physiological and productive requirements but no more. This has been tried experimentally and has effected a significant improvement in feed utilization efficiency and droppings condition.

Water Was Restricted

At Auburn Agricultural Experiment Station in the USA, caged layers were divided into three groups for one month during which the daily temperature ranged from 29 to 38°C, averaging 33°C. The groups were given water for 15-minute periods at intervals of one hour, two hours and three hours.

Egg production from the restricted groups showed no significant difference from the output of control birds provided with water continuously. Manure under the cages of the hens with limited water intake was much drier than manure from the control hens.

At the Florida Agricultural Experiment Station, USA, caged layers of four different commercial strains were split into two groups, one getting water ad lib and the other limited to a 2-hour drinking period twice a day, at 8 am and 4.30 pm.

As at Auburn, egg production was not affected by water restriction. But feed consumption was significantly reduced, averaging 2.76 kg per hen per month for the layers with free access to water and 2.56 kg per hen per month for the controlled intake group.

Mortality was lower on the restricted water regime—11.1% in 12 months against 13.2% among the hens with ad lib water. Water restriction also produced a small improvement in internal egg quality, in the shape of firmer albumen, and a substantial reduction in the manurial moisture content.

These research projects employed two variations of the intermittent watering technique. In one, the hens were allowed to drink for short periods at fairly frequent intervals. In the other they had two longer drinking periods every 24 hours. Both were equally successful, did no harm to egg production, and lent themselves readily to adoption on the commercial egg farm.

Limiting the water prompts the birds to clean out the drinkers twice a day and they recover lost feed particles. This virtually eliminates the chore of cleaning out the water troughs at frequent intervals.

Automatic Control Required

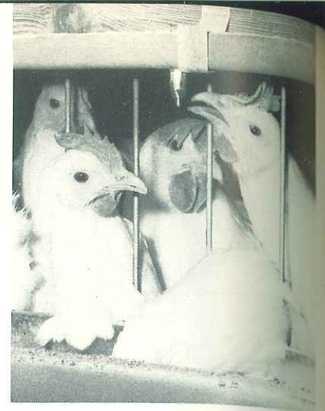
The system used at Auburn requires automatic control. This can be effected with a solenoid valve fitted to the main house water supply pipe and operated by an electric time-switch of the 15-minute interval type commonly used for automatic feeders.

A strainer should be fitted in the supply pipe to filter any small particles which might interfere with the operation of the solenoid. And there should be some by-pass piping arrangement to enable water flow to be controlled manually in any emergency like interruption of the electricity supply. Altogether, the necessary equipment should not cost more than about $150 per cage house, including installation.

With this system, poultrymen may feel some concern that, since the water is off most of the time, they or their staff may not be aware if something goes wrong with the watering equipment. But it is quite a simple matter for an electrician to couple an alarm bell to the time-switch to sound off if the water pressure does not rise immediately the supply is turned on.

The system tried out in Florida may commend itself more to egg producers because it does not necessarily demand a mechanical controller. Since the water only has to be turned on and off twice a day, this is something that can be done manually without much additional effort or distraction from routine chores.

It is worth mentioning that two additional benefits have been found to stem from the intermittent watering technique. With open troughs, layers in cages waste a high proportion of their feed in the drinking water. With mash, this wastage can amount to two or three kilos per hen each year. This is bad enough but, additionally, the spilled feed particles quickly ferment in water and unless the troughs are cleaned out frequently the drinking water can become mildly toxic.



Although not designed specifically for the purpose, there is evidence that nipple drinkers have a limiting effect on hens' daily water intake.

With intermittent watering, the hens empty their drinkers at least twice a day. This gives them a chance to recover lost feed particles and ensures that the water they drink is always fresh. And since they peck the drinkers clean themselves, labour is saved on this otherwise time-consuming chore.

Heavy drinking occurs most commonly in cages fitted with open troughs and cups, probably because the water is always visible and because light reflections and movement on its surface attract the birds' attention.

Although the nipple or peck-a-drop system was not devised with any intention of rationing water, there is some evidence that hens in cages fitted with these valves consume slightly less water than birds in cages with troughs and cups. But no research has yet established whether nipples curb heavy drinking in hot weather as effectively as limiting the water supply.

If nipple valves do not restrict water consumption sufficiently, however, there is no reason why the intermittent watering technique cannot be practised successfully with the peck-a-drop drinker system.

—Anthony Phelps.