

Researcher reports the case of 'the whiteless egg'

UNIVERSITY PARK — Irreverently put, Reynaldo Resurreccion is a poultry sleuth who recently sought to solve an intriguing mystery: the case of the whiteless eggs.

An assistant professor of veterinary science at Penn State, Resurreccion says he thinks he's the first scientist to study albumin-free eggs.

"I was fascinated," he recalls, remembering his first encounter with the miniature chicken eggs containing only a perfectly formed, normal-sized yolk. "While yolkless eggs are not unknown, I could find no reports of eggs without albumin in the scientific literature of the past 30 years."

The story began about a year ago, when a Schuylkill County poultry farmer began finding a worrisome number of abnormalities in his eggs.

About two percent of the 53-week-old layers in one house and the 74-week-old layers in another were producing a combination of fewer eggs, an unusually high number of small normal ones—and some whiteless ones. Many of the latter had shells that were rough

and ruffled with coil-like protuberances. Some contained a tiny amount of water.

Some of the abnormal eggs and the hens that laid them, as well as a few of the flock's normal chickens, were brought to Penn State's Poultry Diagnostic Laboratory.

"We cultured the eggs looking for signs of bacteria, mold, virus or other microorganisms," recalls Resurreccion. "We tested the chickens' blood, searching for antibodies to previous infections."

"Because albumin is manufactured by a specific part of the oviduct, the magnum, we did extensive tests on the magnum tissue. We examined the tissue under an ordinary light microscope, and under scanning electron and transmission electron microscopes."

As Resurreccion reported in June at the 53rd Northeastern Conference on Avian Diseases at Narragansett, R.I., he and electron microscopist Bridget Stemberger discovered two interesting facts.

"While the abnormal eggs were free of virus, bacteria or mold," he explains, "both the normal and

abnormal hens had been infected recently with infectious bronchitis virus.

"More intriguing was the microscope analysis of magnum from normal versus abnormal hens. We found that magnum tissue from the abnormal chickens was heavily swollen with secretion. The cells were so full of albumin which hadn't been released that normal cellular details nearly were obliterated."

"Significantly, there was no inflammation. The swelling was caused by the failure of the secretory cells to release the albumin that apparently had been manufactured normally. Something was inhibiting the trigger mechanism that releases albumin."

Though he cannot pin the secretory failure on the bronchitis virus, Resurreccion suspects a connection.

As he explains, infectious bronchitis is a common disease of chickens. Most often, it affects the respiratory systems of chicks. Some suffocate. However, in the susceptible adult hen, IBV shows only mild respiratory symptoms.

"The infection in hens is expressed as a dramatic, but brief (about two weeks), drop in egg production," says Resurreccion. "In addition, the shells sometimes are ridged and wrinkled, or the eggs are encased in a membrane without a shell. Moreover, sometimes IBV affects the egg quality, causing watery albumin."

"We suspect an IBV connection because all the chickens recently had been infected and some of the

symptoms were similar. For example, some of the abnormal hens stopped laying eggs, molted and, within three months, started laying normally again. This also happens with an IBV infection.

"In the last analysis, however, we can't explain the current phenomenon — or why only about two percent of the flock was affected, when only the entire flock had been exposed to the virus."

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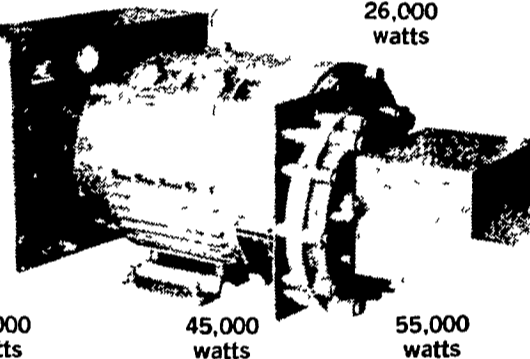
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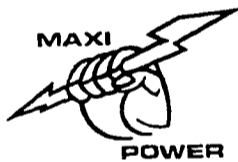
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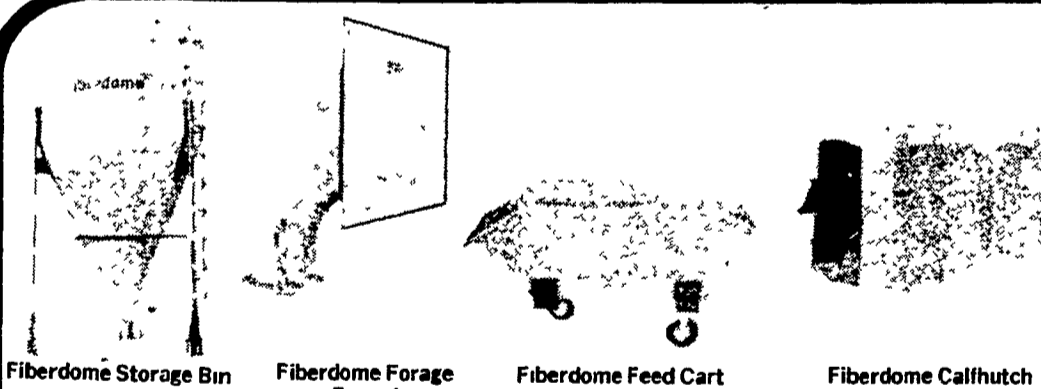
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