

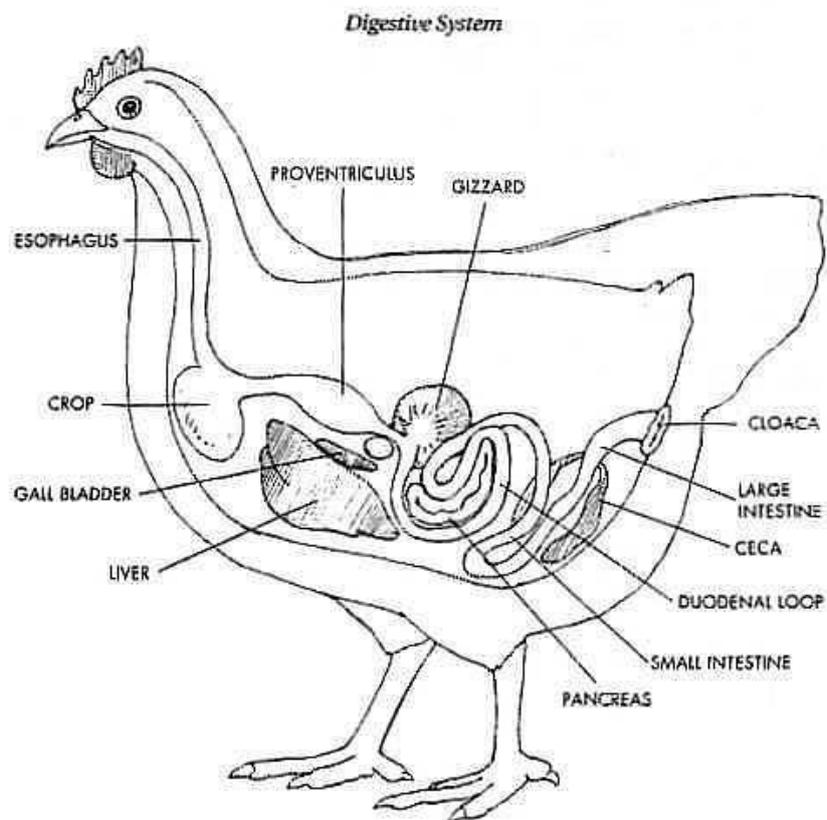
**WPSA (UK Branch) Annual Meeting**  
**4<sup>th</sup>/5<sup>th</sup> April 2011**

**The effect of fully functional crops and feed intake control on growth, feed efficiency, mortality and profitability of broilers housed in large, modern, climate controlled houses.**

by David Filmer MA (Cantab)

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**Fowl's Digestive system**



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**This shows that unlike mammals, birds have crops and gizzards.  
So did some dinosaurs 66 Million years ago.  
And birds descended from them.**

**So, evolution has had plenty of time to perfect bird's crops and gizzards.**

**They are important and efficient parts of their digestive system.**

## Study chicken ancestor -Indian Jungle Fowl Then learn and apply to modern Broilers



**This study showed: -**

- 1) Birds eat twice a day and rapidly fill their crops to avoid predation.
- 2) Their diet includes insects, seeds and plants.
- 3) These are then ground by their muscular gizzards.

Pre-war, chickens were fed a mash feed in the morning and a scratch feed of whole cereals in the afternoon. All very similar to the Jungle Fowl.

## Industry changes in the late 1950's

- ◆ Large numbers of birds kept in intensive houses with no access to pasture including seeds, grains, grit, etc.
- ◆ Mechanisation of feeding systems  
Tube & Chain Feeders, Cable and Flight, now Feed Pans.
- ◆ Feed started to be fed ad-lib (new system).
- ◆ All feed components (including cereals) were ground.
- ◆ 23 hours of light/day common. So poor immune defence.
- ◆ So, no full crops and inactive gizzards. Poorer digestion.

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But in the late 1950's that all changed.

- 1) Ad-lib feeding introduced.
- 2) No whole cereals or hard particles.
- 3) Big changes in lighting programmes.

The result was higher mortality and less efficient digestion.

My work has been to reverse these penalties.

# MAFF funded LINK project - 1998



This project used the EFG model.

Each day the birds got the calculated nutrient intake to produce the desired daily gain.

We then measured actual versus predicted daily gain.

The EFG model was programmed to change daily to minimise the difference.

This varied house to house. We learnt that feedback from the birds is essential for growth rate control.

## Wet Foods for Poultry. Author Forbes J Michael

Avian and Poultry Biology Reviews 14 (4), 2003 pp. 175-193

### Abstract

Historically feeding of wet mashes to poultry has not been recommended for use in large-scale commercial poultry production, on the basis that it does not offer any nutritional advantage and is difficult to apply. However, food soaked and re-dried is utilised more efficiently and recent work has shown repeatedly that mixing conventional foods with sufficient water to make a porridgy consistency (typically 1.5-2.0 kg of water per kg of air-dry food) either increases the proportional retention of nutrients by broilers or increases voluntary food intake. Foods of lower nutrient density (*e.g.* with a high content of cereal) can therefore be used to get the desired growth rate. The improvement in digestion with wet feeding is not likely to be due to activation of endogenous enzymes in the feed but probably involves more rapid penetration of digestive juices into food particles, more rapid and complete digestion and thus the opportunity for higher food intakes. The benefits are seen with both male and female broilers and are greater the earlier in life the wet feeding is started. Growing ducks and laying hens are also more efficient with wet feeding. Practical advantages of giving food in the wet form include the ability to use high levels of cereals without pelleting, the opportunity to fine-tune the composition of the diet on a daily basis (*e.g.* amino acids, medicines) and the great reduction in dust in intensive houses. Disadvantages include the danger of wet litter and dirty feathers, risk of spread of disease and the high cost of feeding equipment. So far wet feeding is not in commercial use although it might be of particular benefit in hot environments.

This **broiler** work showed that wet food gave better growth and food conversion.

Even when equal dry matter was fed.

And that food with a porridge-like consistency was optimal.

I observed that broilers fed meals, have crops containing porridge-like contents.

So functional crops may be one way that fowls improve digestibility and food efficiency.

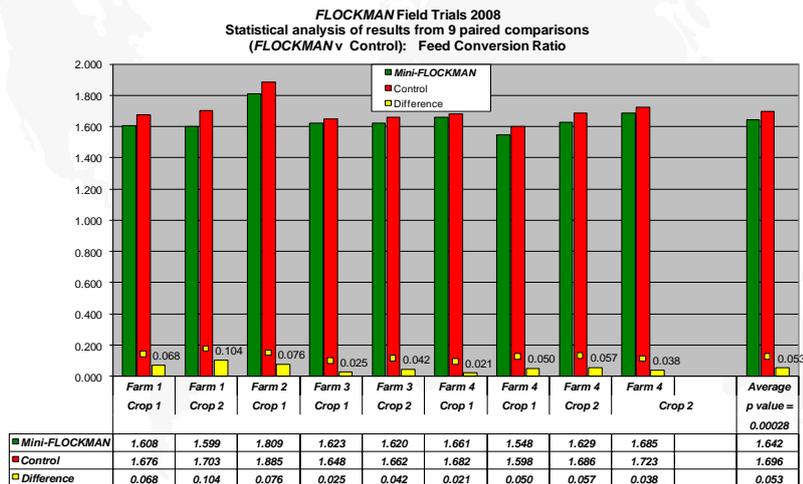
## Equipment controlling lights and feed intake



This shows the 5 component boxes involved.  
They use birds' feedback to control food intake and growth.  
They interface with existing lighting and feeding systems in the broiler house.

We did trials on commercial houses of at least 25,000 birds.  
There were 9 paired comparisons. Each house in a pair was identical in breed/sex and food.  
One house in each pair had the new equipment.

## Results from Field trials - Feed Conversion



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This histogram shows results for Food Conversion Ratio.  
Average benefit was 5 points of FCR: p value was very low.  
All the other histograms are on our website at [www.flockman.com](http://www.flockman.com)

## Results from Field trials – (9 paired comparisons)

- ◆ 95% Confidence limits of the benefits for the various parameters

Parameter	Minimum Expectation	Average Expectation	Maximum Expectation
◆ % Mortality	0.50%	1.01%	1.52%
◆ Liveweight	30 gram	55 grams	80 grams
◆ FCR	0.033	0.053	0.073
◆ EPEF	14.3	20.5	26.6
◆ Margin p/bird	2.59	3.79	4.98
◆ Margin / house	£ 798	£1,083	£1368

### Interpretation

- ◆ Growers will get the Average benefits over many crops on similar farms.
- ◆ And a 97.5% certainty growers will get the Minimum benefits over several crops.

### Conclusion

- ◆ **FLOCKMAN** improves Health, Welfare, Liveweight, FCR and EPEF.
- ◆ An extra Margin of £1,083 per crop gives a payback within two crops.
- ◆ You can be 97.5% certain of payback within three crops.

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**This table shows Average benefits and 95% confidence limits.**

**Benefits were seen in mortality and all performance and financial parameters.**

**All the details are on the Poster.**

**Other work from integrators in the UK and overseas produced similar significant results.**



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**This shows some Google Earth pictures of sites using the system.**

**We have made 175 systems so far.**

**It was a pleasure to show you some of my work since leaving Unilever in the 1980s.**

**Thank you for your attention. I shall be happy to discuss any items in the Poster sessions.**