

AgriLux™

Spectrum LED for Poultry

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UNIVERSITY
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Importance of Light Spectrum as researched by Universities

- ▶ **Red light (University of Guelph):**
 - Faster sexual maturity, longer egg laying cycle
- ▶ **Green and blue light (Various institutions):**
 - Stimulate muscle growth (both *in ovo* and in chicks)
 - Calmer, less active birds (broilers)

What does a producer need?

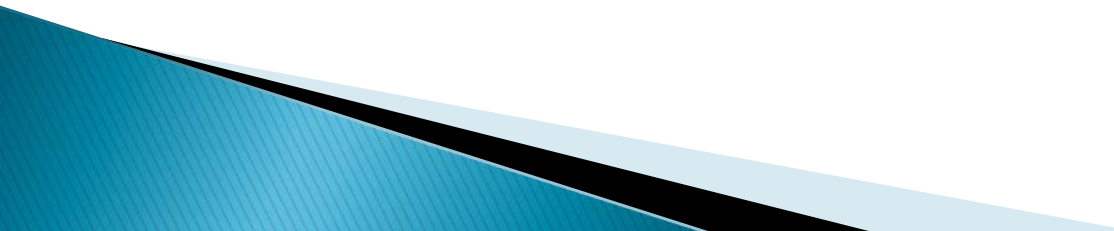
- ▶ The right light for the right application
 - Spectrum
 - Dimming ability (dawn to dusk programs)
 - Stable output (handle power fluctuations; dirty power)
 - ▶ Durability
 - Reliable product that can be used from one flock to the next
 - Withstand harsh barn environments (dust, humidity, ammonia)
 - Withstand repeated cleaning and disinfection cycles (pressure wash, harsh corrosive agents)
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Initial Commercial Pilot Trial



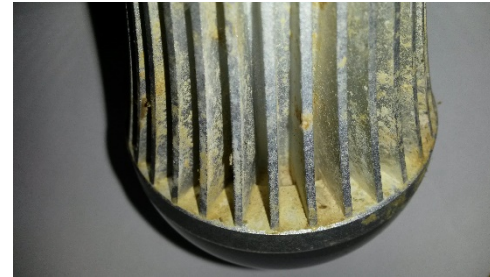
- ▶ New barn with enrichable colony cages (45,000 hens capacity)
- ▶ Equipped with our first prototype (6 Watt LED Red Spectrum bulbs)
- ▶ Lohmann LSL-Lite hens
- ▶ Lohmann's management directives

Positive Results

- ▶ Peak production 97.5–98 % at 22 woa
 - ▶ Still over 90 % when shipped out (72 woa)
 - ▶ Flock average: 365 days = 342.5 eggs/hen
 - ▶ Feed consumption 104 g/day
 - ▶ Electricity consumption reduced by 90%
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How did the Bulbs hold up?

- ▶ Dust caked between the fins of the heatsink
- ▶ Dust and water infiltration inside the bulbs



Need to go back to the drawing board for construction!

AgriLux™



LED Red Spectrum Lamp



**THIES ELECTRICAL DISTRIBUTING
COMPANY INC.**

Features of AgriLux™ LED Spectrum Lamp



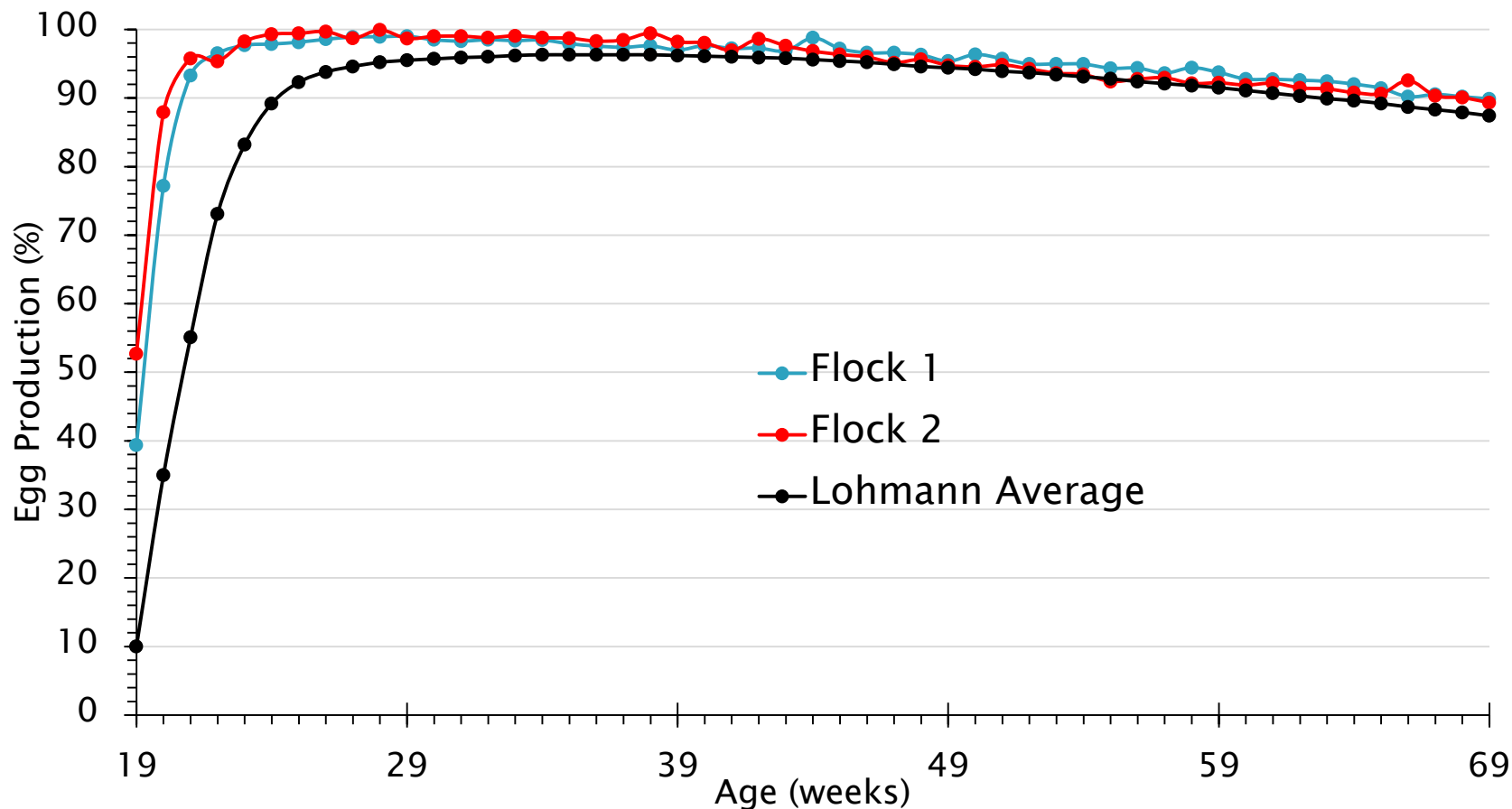
- ▶ Retrofit A19 Type, E26 Med. Base.
- ▶ Custom designed to withstand barn environment.
- ▶ Durable construction shatterproof, dustproof and waterproof (IP66 rated).
- ▶ Illuminates instantly to 100% brightness.
- ▶ Linear dimmable function from 100% to less than 5% without flickering, shutting off or loss of spectrum.

Thorough Follow-up Commercial Trials

- Layer Farm with 45,000 Lohmann LSL– Lite hens
- 22,000 Sq.ft.
- 280 LED Red Spectrum Lamps installed



Average Egg Production with AgriLux™ PLR-10-1 Lamp

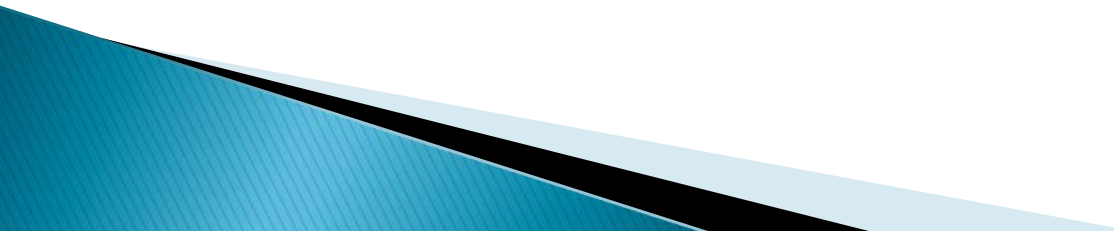


Lohmann Flock Average	Flock 1 Average	Flock 2 Average
89.3 %	94.3 %	94.6 %

Positive Impact and Gains

- ▶ **Improved Egg Production**, minimum of 2–3% as compared to Lohmann Avg.
- ▶ Promotes **longer and higher peak** (reached over 99 %)
- ▶ Hens were **calm** (better welfare).
- ▶ **Feed consumption was reduced** with no significant impact on body weight avg.
- ▶ **No side effects** on egg quality, hens behaviour, health and welfare.

NOTE: Farm management plays a key part in achieving positive results.



Potential \$ Gains in Egg Production

- ▶ Increase in production of 2 % (conservative value)
- ▶ Example: flock of 40,000 hens
- ▶ Lohmann Avg. of 335 eggs per hen, 2% Increase would equal to 341.7 egg per hen over 52 weeks = **268,000 total more eggs** (22,333 dozen).
- ▶ At the current producer price of \$1.90 per dozen, this will provide potential return of **\$42,433. per year!**

Energy Consumption /Savings for 280 LED Light bulbs

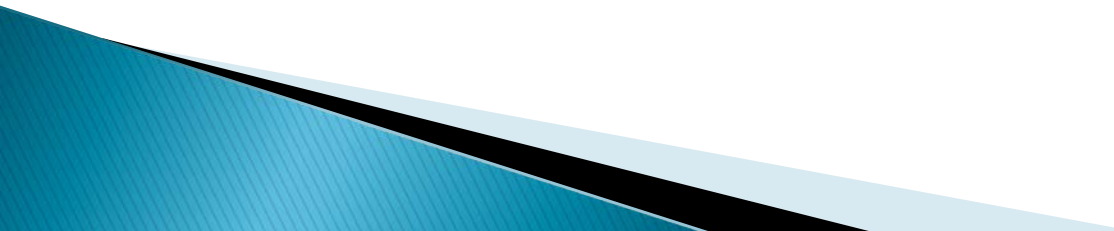
Bulb Type	Power Output	Kw used (14h/d)	Total (kW/Yr)	Approx. Cost/ Yr. (\$0.117 per kWh for ON., excl. HST)	Potential \$\$ Savings/ Yr.
Incandescent	60w	235.2	85,848	\$10,044.	
CFL (Compact Fluorescent)	14w	54.9	20,031	\$2,344.	\$7,700.
LED	10w	43.1	15,739	\$1,674.	\$8,370.

Canadian Poultry Farms with AgriLux LED Spectrum Bulbs installed

Provinces	# of Farms	Farm type	Farm Size
Ontario	6	4– Layers 1–Pullet 1 – Turkey brooder	500 up to 45,000 hens
Alberta	2	Layers	2,000 and 15,000 hens
Saskatchewan	2	Layers	3,000 and 25,000 hens

- Agreements in place with 2 distributors in Western Canada

FUTURE CHALLENGES

- ▶ Meeting the criteria or categories for “Energy Star” and “Design Light Consortium”.
 - ▶ Highlight the return on investment to farmers:
 - LED lighting not a business expense but an investment.
 - ▶ Continue momentum of R&D efforts at the University of Guelph.
 - Currently completing trials for Broiler Breeder and Pullets.
 - ▶ Finding commercial farms that will participate in pilot trials for Broilers, Broiler Breeder and Pullets.
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 - Charlene Hanlon
 - ▶ Arkel Research Farm Staff
 - ▶ Len Zoller (Consultant for Thies Electrical Distributing)
 - ▶ Douglas Dykstra (Owner of Dykstra's Poultry Farm)
 - ▶ Gord Surgeoner, Past President (OAFT, Ontario Agri-Food Technologies)
 - ▶ Tyler Whale, President OAFT
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