



COST THE CHANGES

SAVE HUNDREDS ON YOUR ENERGY COSTS: LIGHTING FOR BROILER CHICKEN BARNs

REDUCE YOUR ENERGY COSTS...
DECREASE YOUR PRODUCTION COSTS...
INCREASE YOUR PROFIT...

Typically, an agricultural operation can reduce its energy costs by an estimated 10 to 15% by cutting out waste, practicing proper maintenance and making minor modifications to operating practices. Thus, with little or no expenditure, Alberta farmers could save more than \$60 million dollars a year by simply using their energy inputs more efficiently.



ASSESSING YOUR ENERGY COSTS

The first step in reducing your own energy costs is to take a look at your current energy use. Where are you using energy? How is it being used? How much is used? And how much does it cost? You can collect this information by doing an energy audit. Pages 2 and 3 provide energy audit sheets for lighting.

With the information from your energy audit, you will have a good basis for assessing where cost-effective energy

conservation methods might be implemented. Then you can estimate the net costs of the various options and find the option that best meets your needs.

REDUCING LIGHTING COSTS FOR BROILER CHICKEN BARNs

A simple way to begin reducing lighting costs for your poultry operation is to identify no-cost or low-cost energy conservation opportunities which, immediately increase energy efficiency and eliminate wasteful uses of energy. For example, you may have the lights on when it isn't necessary. However, take care when reducing lighting because it affects bird behaviour. High light levels can lead to aggression, cannibalism and reduced feed and water intake; light duration may affect total feed intake and growth rates. For more information on lighting and photoperiods, see Canada Plan Service's Lighting for Poultry Housing ([http:// www.cps.gov.on.ca](http://www.cps.gov.on.ca) and follow the links).

An option for many producers is to change the light bulbs from incandescent to a more energy efficient lighting system.

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THE MAIN ALTERNATIVES FOR LIGHTING IN POULTRY FACILITIES ARE:

Incandescent: This is the most common type of lighting for indoor and outdoor home use. It is also the least energy efficient of the common lighting types. An incandescent bulb produces light by electrical energy heating a filament of fine wire that glows white-hot when the current flows through it. Only 10% of the energy goes to producing light; the rest goes into heat.

Compact fluorescent: Fluorescent lighting is about four times as efficient as incandescent. It is commonly used for indoor applications, but outdoor use is increasing. A compact fluorescent light bulb can be used in regular incandescent light fixtures. There are also dimmable compact fluorescent lights available.

Tube fluorescent: This type of fluorescent lighting can be dimmed to suit the birds' lighting needs. However, the dimming process can often use as much energy as leaving the lights on bright. The fluorescent housings need to be moisture-proof and dust-proof. Also, fixtures for fluorescent tubes are required; the tubes cannot be used in incandescent fixtures. This option is most feasible when a new barn is being designed and built.

ELECTRICITY BILL TRACKER

Utility Company:	Account Number:	Meter Location/ Metered Use:

Use a new sheet for each meter on your farm.

Record billing information for at least 12 months.

The first line of the tracker shows an example from a sample bill.

Billing Period	Electrical Energy Used (kWh)	Rate (¢/kWh)	Cost of Electrical Energy (\$)	Meter Reading		Comments
				Date of Last Reading	Actual Meter Reading	
1. <i>Oct 16 - Nov 14</i>	<i>25.06</i>	<i>5.6</i>	<i>1.40</i>	<i>Aug 14</i>	<i>27399</i>	<i>Consumption seems O.K.</i>
2.						
3.						
4.						
5.						
6.						
7.						
8.						
9.						
10.						
11.						
12.						
Totals						

LIGHTING WORKSHEET

EXISTING LIGHTS AND CONTROLS

Please use a new sheet for each area, location, or room.

Location of Lights: _____ Date: _____

Types of fixtures: <i>(Incandescent, fluorescent, etc.)</i>	
Number of fixtures:	
Number of bulbs per fixture: <i>(If fluorescent, give length of tube)</i>	

PRESENT LIGHT LEVELS

Too bright: _____ Adequate: _____ Too dim: _____

LIGHTS ARE ON:

hours/day: _____ days/week: _____ weeks/year: _____

Can lights be switched on and off as desired? Yes _____ No _____

Can lower wattage bulbs be installed? Yes _____ No _____

Can more efficient bulbs/fixtures be retrofitted? Yes _____ No _____

ADDITIONAL HOURS LIGHTS COULD BE TURNED OFF hours/day: _____ days/week: _____ weeks/year: _____

TIMERS, SENSORS, PHOTOCELLS

Are the lights manually controlled? (no timers, sensors, etc.) Yes _____ No _____

Is there an automatic timer? Yes _____ No _____

Is it set properly? Yes _____ No _____

Is there an occupancy sensor? Yes _____ No _____

Can an occupancy sensor be installed? Yes _____ No _____

Is there a photocell sensor? Yes _____ No _____

Can a photocell sensor be installed? Yes _____ No _____

WHAT ACTION CAN I TAKE?

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SAVE HUNDREDS OF DOLLARS... BY REVIEWING LIGHTING OPTIONS FOR BROILER CHICKEN BARN!

LIGHTING NEEDS 10,000 BROILER CHICKENS OVER 42 DAYS

THIS CALCULATION OF THE KILOWATT HOURS/BIRD/DAY (KWH/BIRD/DAY) IS BASED ON RECOMMENDED LIGHT LEVELS, PHOTOPERIODS AND BIRD DENSITIES.

Incandescent: 4.5 watt hours/bird/day = 0.0045 kWh/bird/day

Fluorescent: 1.1 Wh/bird/day = 0.0011 kWh/bird/day

(To convert from watt hour (Wh) to kilowatt (kWh), divide by 1000.)

ENERGY COST PER DAY

If energy costs \$0.06 per kilowatt hour then:

- Incandescent: 0.0045 kWh/bird/day x \$0.06/kWh x 10,000 birds = \$2.70/day for 10,000 birds
- Fluorescent: 0.0011 kWh/bird/day x \$0.06/kWh x 10,000 birds = \$0.66/day for 10,000 birds

COMPARISON OF ENERGY COSTS

(NOT INCLUDING COST OF BULBS)

Assuming 42 days of production:

- Incandescent: \$2.70/day x 42 = \$113.40
- Fluorescent: \$0.66/day x 42 = \$27.72

Thus fluorescent lighting results in energy cost savings of \$85.68 not including the cost of the bulbs.

COST OF BULBS

- An incandescent 60 watt bulb costs \$0.94 and lasts an average of 1000 hours (42 days), so it costs about \$0.02 per day.
- A compact fluorescent 13 watt bulb costs \$7.95 and lasts an average of 6000 hours (250 days), so it costs about \$0.03 per day.
- A dimmable compact fluorescent 23 watt bulb costs \$25.98 and lasts an average of 7300 hours (304 days), so it costs about \$0.09 per day.

Thus, over a 42-day growing period:

- An incandescent bulb costs: \$0.02 x 42 = \$0.94
- A compact fluorescent bulb costs: \$0.03 x 42 = \$1.34
- A dimmable compact fluorescent bulb costs: \$0.09 x 42 = \$3.78

Assuming 20 bulbs are needed in a 10,000-bird barn, (In many cases you will need fewer fluorescent bulbs than incandescent, but for this purpose we will consider them equal):

- Incandescent bulbs cost: \$0.94/bulb x 20 bulbs = \$18.80
- Compact fluorescent bulbs cost: \$1.34/bulb x 20 bulbs = \$26.80
- Dimmable compact fluorescent bulbs cost: \$3.78/bulb x 20 bulbs = \$75.60

TOTAL COMPARISON OF ENERGY COSTS

(INCLUDING BULB COSTS)

- Incandescent: \$113.40 + \$18.80 = \$132.20
- Compact fluorescent: \$27.72 + \$26.80 = \$54.52
- Dimmable compact fluorescent: \$27.72 + \$75.60 = \$103.32

You save \$77.68 with one flock of birds in one barn by using compact fluorescent lighting.

You save \$28.88 with one flock of birds in one barn by using dimmable compact fluorescent.

Multiply that savings in one barn...over a year and that is significant.

By using compact fluorescent \$77.68 x 6 = a savings of \$466.08/barn/year. Multiply that savings by all the barns on your operation. Just think of the total savings. Four barns would be close to \$2000 saved per year.

By using dimmable compact fluorescent \$28.88 x 6 = a savings of \$173.28/barn/year. Multiply that savings by all the barns on your operation. Just think of the total savings. Four barns would be close to \$700 saved per year.

Dimmable compact fluorescent are relatively new on the market, and in time the price/unit will become more competitive, making the savings more beneficial.

Thus, the *actual* energy used in fluorescent lighting is less expensive than incandescent, however you still need to consider the costs associated with the light bulbs and if necessary fixture conversions.

By calculating the costs for energy, bulbs and if necessary fixture conversions, you can determine which is the most cost effective option for your operation, whether it be poultry, feedlot or hogs.

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