

LITMUS FQI AMMONIA INDICATORS

New, Low Cost, Easy to Use Solutions for Poultry Ammonia Level Maintenance



Scientific Team

National Center for Toxicological Research (NCTR)



Litmus FQI Colorimetric Sensor Technology was developed at the U.S. Food and Drug Administration's National Center for Toxicological Research.

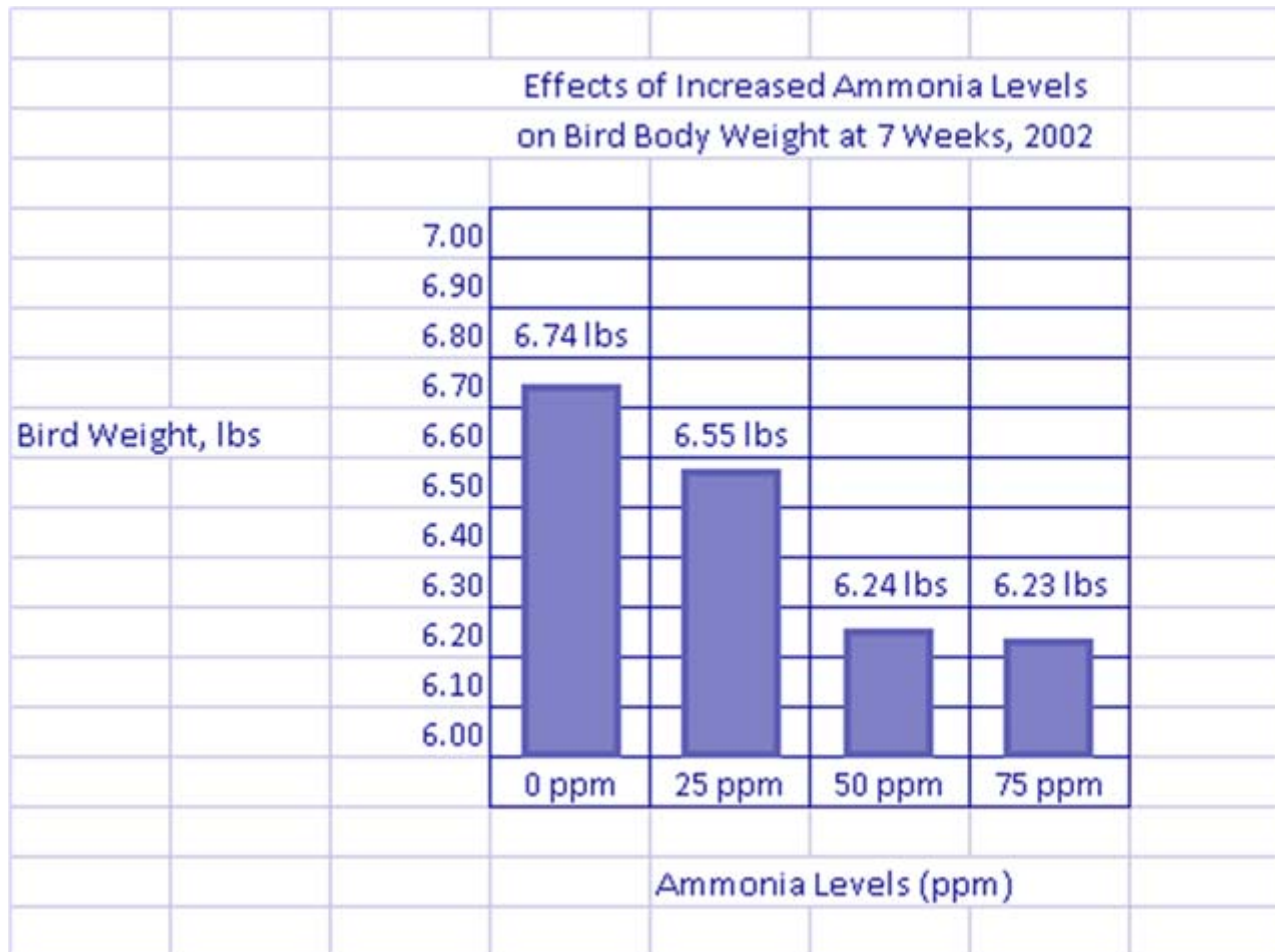
160 Ph.D. Scientists

\$1.5B USD Facility

Over 50 Research Labs





An inexpensive, repeatable and reliable tool to help maintain a 4 and 24 hour average ammonia level of 25 ppm or 50 ppm.

- “It is a well established fact that in order to maximize broiler performance it is crucial that ammonia levels are kept to a minimum during the grow-out.”
- “Numerous studies have shown that ammonia concentrations over 20 ppm reduce weight gains, increase feed conversions, decrease bird uniformity and yield as well as increase susceptibility to disease”.
- “The problem is that many broiler producers have difficulty in smelling the difference between 20 and 40 ppm so they might have harmful levels of ammonia in their house and not even be aware of it.”



Dr. Berry Lott - MSU

Present Ammonia Measurement Methods

	<u>Sensor Name</u>	<u>Cost</u>	<u>Accuracy</u>	<u>Usability</u>
	Hydrion Text Paper	Inexpensive	Imprecise	Interpretation Required
	Gas Detection Tubes	Expensive	Variable	Fairly Easy
	<ul style="list-style-type: none"> ■ Pump \$165-\$300 ■ 10 Tubes \$25-\$35 			
	Passive Dosimeter Tubes	Expensive	Variable	Interpretation Required
	<ul style="list-style-type: none"> ■ 10 Tubes \$60.00 ■ \$6.00 Each 			
	Electronic Ammonia Meter	Expensive	Variable	Frequent Recalibrations
	<ul style="list-style-type: none"> ■ \$1,000-\$1,500 ■ Re-calibration required 			

THE LITMUS AMMONIA INDICATOR SOLUTION



THE LITMUS AMMONIA INDICATOR SOLUTION

- 1. 25 ppm Ammonia Indicator designed for:**
 - Placing biddies/chicks during the first few weeks of the grow out period.**
 - Growing larger, healthier birds by maintaining the ammonia level recommended by the National Chicken Council.**
- 2. 50 ppm Ammonia Indicator designed for:**
 - Growing mature birds during the remaining weeks of the grow out period.**

HOW THE LITMUS AMMONIA INDICATOR WORKS

Each Ammonia Indicator has a colorimetric indicator which changes color from yellow to blue at specific rates to indicate ammonia levels at the 25 or 50 ppm targets.

Single or multiple Ammonia Indicators are placed in various locations in a Poultry House for 24 hours (daily).



In 4 hours, the Ammonia Indicator identifies whether ammonia levels are above/on or below the target of 25 or 50 ppm. This reading offers the grower an opportunity to make immediate house adjustments.

Note: If adjustments are the Litmus Ammonia Indicator should be replaced.

In 24 hours, the Ammonia Indicator offers a 24 hour time weighted average of the day's ammonia levels. This reading offers a method to judge the amount of "adjustments" needed to maintain an average reading of 25 or 50 ppm or less and can provide a permanent recording of ammonia levels (over time) to assist in establishing long term "adjustment" procedures.

THE LITMUS AMMONIA INDICATOR SOLUTION



Size – 2" x 5"

WARNING!
KEEP BAG SEALED TO PREVENT
AMMONIA EXPOSURE BEFORE PLACEMENT

LITMUS AMMONIA INDICATOR
Patent Pending

Directions

- Record on Indicator: Date, Time, Grower, House #
- Hang Ammonia Indicators at appropriate locations in each house.

4 Hour Indicator and 24 Hour Indicator

- Record on Indicator: Length of color change at 4 or 24 hours. If the indicator shows the ammonia levels are below the 4 or 24 hour mark, no operational adjustments are required. If the Indicator levels are above the 4 or 24 hour mark operational adjustments should be taken immediately.

**IF 4 HOUR ADJUSTMENTS ARE MADE, REPLACE THE AMMONIA INDICATOR ;
OTHERWISE REPLACE DAILY!**

FOR THE GROWER

- Lower Ammonia Levels = Birds less susceptible to disease.
- Lower Ammonia Levels = Better Feed Conversion
- Lower Ammonia Levels = A healthier grower
- Lower Ammonia Levels = Less air pollution
- Lower Ammonia Levels = Heavier Birds = More Revenue!

FOR THE INTEGRATOR

“To get ammonia levels down below 25 ppm on built-up litter typically requires the use of some type of litter treatment.” UGA Poultry Science Center

- The Ammonia Indicator identifies ammonia levels above and below a target of 25 or 50 ppm.
- The Ammonia Indicator can be used safely by untrained grower personnel.
- The Ammonia Indicator design allows it to be “customized” to include Your Brand Name and litter treatment ordering information.
- The Ammonia Indicator is inexpensive enough to give (or sell) to your customers.
- **Your LITMUS Ammonia Indicator PLUS your ammonia control methods = Your Satisfied Customer**

THE BENEFITS

Revenue Increases By Controlling Ammonia

"Whenever ammonia is not controlled (down to the 20 to 25 ppm level) you are looking at birds weighing up to a half pound less when they are ready to market. This has a tremendous impact on the grower"

Berry Lott, Ph.D.

Mississippi State University Adjunct

House Quantity	# Birds Placed	# Surviving Birds	75 ppm Ave. WT	75 ppm Total WT	Price Per lb.	Revenue Per House	25 ppm Ave. WT	25 ppm Total Weight	Price Per lb.	Revenue Per House	Add'l Revenue	Grow Outs	Annual Total Increased Revenue
1	26,000	25,000	6.23	155,750	0.05	\$7,787.50	6.55	163,750	0.05	\$8,187.50	\$400.00	5.5	\$2,200.00
2	52,000	50,000	6.23	311,500	0.05	\$15,575.00	6.55	327,500	0.05	\$16,375.00	\$800.00	5.5	\$4,400.00
3	78,000	75,000	6.23	467,250	0.05	\$23,362.50	6.55	491,250	0.05	\$24,562.50	\$1,200.00	5.5	\$6,600.00
4	104,000	100,000	6.23	623,000	0.05	\$31,150.00	6.55	655,000	0.05	\$32,750.00	\$1,600.00	5.5	\$8,800.00
5	130,000	125,000	6.23	778,750	0.05	\$38,937.50	6.55	818,750	0.05	\$40,937.50	\$2,000.00	5.5	\$11,000.00
6	156,000	150,000	6.23	934,500	0.05	\$46,725.00	6.55	982,500	0.05	\$49,125.00	\$2,400.00	5.5	\$13,200.00
7	182,000	175,000	6.23	1,090,250	0.05	\$54,512.50	6.55	1,146,250	0.05	\$57,312.50	\$2,800.00	5.5	\$15,400.00
8	208,000	200,000	6.23	1,246,000	0.05	\$62,300.00	6.55	1,310,000	0.05	\$65,500.00	\$3,200.00	5.5	\$17,600.00
9	234,000	225,000	6.23	1,401,750	0.05	\$70,087.50	6.55	1,473,750	0.05	\$73,687.50	\$3,600.00	5.5	\$19,800.00
10	260,000	250,000	6.23	1,557,500	0.05	\$77,875.00	6.55	1,637,500	0.05	\$81,875.00	\$4,000.00	5.5	\$22,000.00
15	390,000	375,000	6.23	2,336,250	0.05	\$116,812.50	6.55	2,456,250	0.05	\$122,812.50	\$6,000.00	5.5	\$33,000.00
20	520,000	500,000	6.23	3,115,000	0.05	\$155,750.00	6.55	3,275,000	0.05	\$163,750.00	\$8,000.00	5.5	\$44,000.00
30	780,000	750,000	6.23	4,672,500	0.05	\$233,625.00	6.55	4,912,500	0.05	\$245,625.00	\$12,000.00	5.5	\$66,000.00
50	1,300,000	1,250,000	6.23	7,787,500	0.05	\$389,375.00	6.55	8,187,500	0.05	\$409,375.00	\$20,000.00	5.5	\$110,000.00
75	1,950,000	1,875,000	6.23	11,681,250	0.05	\$584,062.50	6.55	12,281,250	0.05	\$614,062.50	\$30,000.00	5.5	\$165,000.00
100	2,600,000	2,500,000	6.23	15,575,000	0.05	\$778,750.00	6.55	16,375,000	0.05	\$818,750.00	\$40,000.00	5.5	\$220,000.00
1,000	26,000,000	25,000,000	6.23	155,750,000	0.05	\$7,787,500.00	6.55	163,750,000	0.05	\$8,187,500.00	\$400,000.00	5.5	\$2,200,000.00
2,500	65,000,000	62,500,000	6.23	389,375,000	0.05	\$19,468,750.00	6.55	409,375,000	0.05	\$20,468,750.00	\$1,000,000.00	5.5	\$5,500,000.00

LITMUS FQI offers:

- **LITMUS FQI Ammonia Indicator provides a solution to assist poultry growers in maintaining a 4 and 24 hour average ammonia level of 25 or 50 ppm.**
- **One of a kind Litmus Ammonia Indicators directly and objectively assist in growing healthier and larger birds.**
- **A value proposition wanted and needed by all sectors of Poultry Growing:**
 - Increased revenue.
 - Increased brand awareness
 - Increased revenue through differentiation/exclusivity.
 - Reduced ammonia emissions
 - Improved quality of life, peace of mind.

LITMUS FQI AMMONIA INDICATORS



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