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Effects of O₃ on swine barn Air treatment

Report written for : ITP France
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Summary of report written in French a full copy of French report is available on demand from Ozomax inc..

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Summary :

A study was conducted to evaluate the effect of O3 on ammonia removal , odor , flora and weight gain on piglets and pigs .

An OZOMAX Model OZO 4HD unit was used to treat half of 274 piglets and the other half was kept without Ozone and used as control. Area per animal was 0.35 M2.

Due to initial problems in the installation (mainly electrical connections not related to the OZOMAX unit) O3 was not controlled properly using the O3 monitor for a period of 13 days in the Beginning . Proper electrical connections were done after the first 13 days.

Many measurements were done on the weight gain , ammonia and odors but we will just report in this report the data on Ammonia, aerobic bacteria and odor removal The following variables were recorded at different frequencies

Variable	Units	Frequency
Temperature	C	Every 15 minutes Kept at 26.2 +/- 0.8
Ammonia	Milligram/M3	Once a week Titration method with acid solution (very accurate method)
Odor	Odor units per M3	Method NFX43-101 and NF X 43-104 French standards. Once/week
Bacteria	CFU/M3	Once a week for Mesophile flora
Air flow rate	M3/h/pig	Continuous at 8.9+/-5.9

Ammonia results

Height from floor of sample	Control room	Ozonated room	Remarks
0.3 M	21.1 +/- 10.8	15.0 +/- 5.0	O3 reduce standard deviation And reduce ammonia by an average 25%
1.0 M	19.8 +/- 9.0	13.2 +/- 4.3	O3 reduce standard deviation And reduce ammonia by an average 30%
0.3 M After 26 to 33days	35	20	O3 reduced ammonia by 42.8%
1.0 M After 26 to 33 days	30	15	O3 reduced ammonia by 50%

Odor results

	Control room	Ozonated room
Odor concentration Odor units /m3	1534 +/- 614	1028 +/- 1028 +/- 563
Air flow rate	1395 M3/h +/- 471.2	1167 M3/h +/- 424.2
Odor per pig per day	3.96 x 10 exp5	2.34 x 10 exp 5
Average % reduction in odours		41 % odor reduction overall average

Aerobic Mesophile bacteria Flora

	Control Room	Ozonated room
Concentration CFU/m ³	7.2 x 10 ⁴ +/- 4.7x10 ⁴	3.2 x 10 ⁴ +/- 2.6 x10 ⁴
Concentration per pig	5.3x 10 ²	2.4 x 10 ²
Average reduction		Overall average reduction 55.6 %

Conclusion

Despite initial electrical installation problems encountered this study demonstrate that O₃ has beneficial effects in reducing ammonia, odors and aerobic bacteria.

A better installation is planned for a future study on a larger sample to evaluate the weight benefits which were not very conclusive in this study.

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