

TECHNICAL NOTE

MLC, STOTFOLD. EPIZYM PIGS EVALUATION

The evaluation started at the unit in March 1998 treating a few rooms both in the Farrowing Houses and Flat Decks for the weaners. This unit is both an applied pig research development and demonstration farm incorporating both best modern practice and equipment. Visiting the unit clearly shows the high state of cleanliness and good quality atmospheres within the houses. The only notable areas of concern are the fly populations and some problems associated with emptying out the channels through slurry crusts and sludges.

Rooms were selected for treatment and these followed normal protocols - purge dose of 1 Kg per 4000 gallons and maintenance dose of 1 Kg per 8000 gallons, both to be applied when the channels are approx. 10% full. Weekly subjective assessments were made on the following criteria - Environment, Ammonia, Flies, Pig Health, Slurry surface solids and Slurry floor solids. These factors were scored 1 to 5 with 1 being exceptionally good and 5 being exceptionally bad. Slurry samples were taken and sent off to NRM Ltd for analysis, including Chemical Oxygen Demand (COD) and Biological Oxygen Demand (BOD). The COD factor being important to the Unit as all slurry goes through a separator and the liquor onto the Anglian Water's sewage plant next door. Charges are based upon volume, COD and Solids.

Results.

1. Subjective Analysis.

Summary attached as Appendix 1. This has the first week of the treated rooms removed to allow for the lag and log phase of bacterial growth. It is arguable that the first 2 weeks could be removed.

a. Farrowing Houses.

Two rooms recorded for Control and One for Treated. Little differences were noted for all non slurry factors although all were scoring from just over 1 (exceptionally good) to just over 2 (good). However for both Slurry surface and floor solids the results a good improvement was noted. Surface solids being score 1.15 (1.2 v 2.35) better and floor solids 0.5 (1.9 v 2.4) better. The nature of the product's activity is well demonstrated by improving significantly between Treatment 1 (Purge) and Treatment 2 (Maintenance). The bacteria need 2 to 3 weeks, following the purge dose, to become well established and begin to liquefy the solids whereas liquefaction continues (perhaps only a week's log and lag phase) almost uninterrupted following the Maintenance dose. The level of carried forward solid build up influences the result of the purge treatment.

b. Flat Decks.

One room for Control and Three rooms for Treated. Again, little difference were noted for non slurry factors all scoring just over 2 (good). However for both Slurry surface and floor

solids the results a good improvement was noted. Surface solids being score 1.67 (1.05 v 2.82) better and floor solids 1.56 (1.26 v 2.82) better.

Comment.

The results are disappointing, at first sight, not to show improvements in Environment and Ammonia. Clearly all levels are very low and acceptable and reflect the excellent ventilation systems employed. Observations and trials elsewhere support the reduction in these factors through treatment where levels are much higher. It is difficult to smell the ammonia at Stotfold whereas other units it can vary from being very noticeable to overpowering!

Normally flies (and other insects) will lay their eggs into the slurry surface solids and this perpetuates the population. Where good liquefaction gives a very watery surface to the slurry, fly populations are much lower as the flies cannot lay their eggs into this preferred medium. This does not appear to be the case here. Looking at the 3 flat decks that were treated, 2 showed a marked improvement scoring 1.6 and the third room had a very poor score of 3.6 - this needs to be looked into further.

2. Laboratory Analysis

Two sets of samples were sent to the lab. Initially 3 samples were taken from the early treated rooms, with a control set from the farrowing house. Further samples were sent from 2 sampling dates, both of which were stored in a fridge for upto 4 weeks. Storage unfortunately will alter the results, partially on total solids but more importantly on BOD. This through continuing bacterial activity reducing the level to a near common standard. Sorting out the sampling dates in relation to treatment dates some samples from treated rooms are clearly too close and the results do not reflect the treatment's effect. It is recognised that obtaining a representative sample from channels is difficult.

A summary of the results are enclosed as Appendix 2.

a. Farrowing House

Total Solids, Phosphate and Potassium show similar levels although mathematical % differences give some interest. The total solids figures do not correspond to the subjective analysis. The total (+33%) and ammonical (+56%) nitrogen figures are higher with treatment. This indicates higher Nitrogen retention within the slurry and in the form of ammonical nitrogen (both ammonium salts and ammonia held within the bacterial biomass). This has benefits to crops where the slurry is applied. The figures are compromised by one set - FHG, if removed then results are closer and reflect other analyses performed elsewhere. The COD and BOD figures show improvements of some 30 - 40%. The nitrogen and ammonia figures indicate the strong establishment of the Epizym Pigs within the slurry.

b. Flat Decks

Improvements in Total Solids, Nitrogen, Ammonical Nitrogen and COD follow expected trends. Other factors do not.

Comment.

The figures are confused and do not follow patterns obtained elsewhere. The base cause is, I believe, rooted in the storage of the samples and the change in the state this will give. However 3 samples were taken and sent immediately to the laboratory and these can be used with confidence. Changes from treated to control.

These show:

Total Solids -48%.	Total N -5%	Ammonical N + 36%
% Amm N : Tot N +43%	COD -56%	BOD -57%

Conclusion

This is not a scientific based, replicated trial. The unit has many special features not found on many commercial units, these include, exceptional standard of hygiene and general management and special attention to slurry channel management. These high standards will always diminish the result from treatment, but some improvements are to be found.

No data on pig performance has been looked for but, in general, Epizym Pigs gave improvement in slurry solids, consistency and ease of emptying channels. Fly populations have been improved with the exception of one house. The excellent ventilation systems gave such good atmospheres that no improvement was able to be detected by human assessment.

Lisa Taylor, the unit manager, has no hesitation in recommending Epizym Pigs for treating problem slurry channels.

G T Dadd

Agricultural Consultant to Epizym Ltd.

Appendix 1

Flat Decks

Average	Control		Treated			
Period	1st Period	2nd Period	Period	1st Period	2nd Period	Factor
2.45	2.40	2.50	2.46	2.63	2.30	Enviroment
2.36	2.40	2.33	2.56	2.68	2.43	Ammonia
2.36	2.40	2.33	2.41	2.77	2.05	Flies
2.00	2.00	2.00	2.23	2.20	2.25	Pig Health
2.82	3.00	2.67	1.22	1.43	1.00	Surface solids
2.82	3.00	2.67	1.41	1.43	1.38	Floor solids

Farrowing Houses

Average	Control		Treated			
Period	1st Period	2nd Period	Period	1st Period	2nd Period	Factor
2.20	2.10	2.30	2.27	2.20	2.33	Enviroment
1.25	1.10	1.40	1.27	1.20	1.33	Ammonia
1.55	1.50	1.60	2.18	2.40	2.00	Flies
2.05	2.30	1.80	2.09	2.60	1.67	Pig Health
2.35	2.50	2.20	1.27	1.60	1.00	Surface solids
2.40	2.50	2.30	1.91	2.40	1.50	Floor solids

Appendix 1

Flat Decks

1st Week Removed

Average	Control		Treated			
Period	1st Period	2nd Period	Period	1st Period	2nd Period	Factor
2.45	2.40	2.50	2.45	2.62	2.30	Enviroment
2.36	2.40	2.33	2.46	2.50	2.43	Ammonia
2.36	2.40	2.33	2.42	2.86	2.05	Flies
2.00	2.00	2.00	2.25	2.24	2.25	Pig Health
2.82	3.00	2.67	1.05	1.12	1.00	Surface solids
2.82	3.00	2.67	1.26	1.12	1.38	Floor solids

Farrowing Houses

1st Week Removed

Average	Control		Treated			
Period	1st Period	2nd Period	Period	1st Period	2nd Period	Factor
2.20	2.10	2.30	2.30	2.25	2.33	Enviroment
1.25	1.10	1.40	1.30	1.25	1.33	Ammonia
1.55	1.50	1.60	2.20	2.50	2.00	Flies
2.05	2.30	1.80	2.10	2.75	1.67	Pig Health
2.35	2.50	2.20	1.20	1.50	1.00	Surface solids
2.40	2.50	2.30	1.90	2.50	1.50	Floor solids

MLC SLURRY

Appendix 2

FARROWING HOUSES

CONTROL

HOUSE	TOTAL SOLIDS	TOTAL N	AMM. N	% AMM /TOT N	TOTAL P	TOTAL K	COD ,000	BOD ,000
FHH	3.56	0.37	2193	59.27	0.08	0.19	75.6	12.6
FHG	0.63	0.11	913	83.00	0.02	0.07	190	4.2
FHJ	1.58	0.23	1921	83.52	0.04	0.13	74	5.5
AVERAGE	1.92	0.24	1675.67	75.26	0.05	0.13	113.20	7.43

TREATED

FHE	1.86	0.35	2976	85.03	0.03	0.2	33	5.4
FHE	2.33	0.28	2299	82.11	0.05	0.17	102	4.8
AVERAGE	2.10	0.32	2637.50	83.57	0.04	0.19	67.50	5.10
Diff %	8.93	33.10	57.40	11.03	-14.29	42.31	-40.37	-31.39

FLAT DECKS

CONTROL

FD1	2.62	0.35	2472	70.63	0.07	0.28	230	5.6
FD1	1.04	0.23	2079	90.39	0.01	0.2	54	5.1
AVERAGE	1.83	0.29	2275.50	80.51	0.04	0.24	142.00	5.35

TREATED

FD4	1.61	0.31	2190	70.65	0.02	0.26	25.8	6.9
FD6	1.63	0.27	2284	84.59	0.03	0.17	84	4.3
FD6	2.16	0.34	2646	77.82	0.04	0.08	66	5.3
AVERAGE	1.80	0.31	2373.33	77.69	0.03	0.17	58.60	5.50
Diff %	-1.64	5.75	4.30	-3.51	-25.00	-29.17	-58.73	2.80

MLC SLURRY

Appendix 2

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FHG	0.63	0.11	913	83.00	0.02	0.07	190	4.2
FHJ	1.58	0.23	1921	83.52	0.04	0.13	74	5.5
AVERAGE	1.92	0.24	1675.67	75.26	0.05	0.13	113.20	7.43

TREATED

FHE	1.86	0.35	2976	85.03	0.03	0.2	33	5.4
FHE	2.33	0.28	2299	82.11	0.05	0.17	102	4.8
AVERAGE	2.10	0.32	2637.50	83.57	0.04	0.19	67.50	5.10
Diff %	8.93	33.10	57.40	11.03	-14.29	42.31	-40.37	-31.39

FLAT DECKS

CONTROL

FD1	2.62	0.35	2472	70.63	0.07	0.28	230	5.6
FD1	1.04	0.23	2079	90.39	0.01	0.2	54	5.1
AVERAGE	1.83	0.29	2275.50	80.51	0.04	0.24	142.00	5.35

TREATED

FD4	1.61	0.31	2190	70.65	0.02	0.26	25.8	6.9
FD6	1.63	0.27	2284	84.59	0.03	0.17	84	4.3
FD6	2.16	0.34	2646	77.82	0.04	0.08	66	5.3
AVERAGE	1.80	0.31	2373.33	77.69	0.03	0.17	58.60	5.50
Diff %	-1.64	5.75	4.30	-3.51	-25.00	-29.17	-58.73	2.80