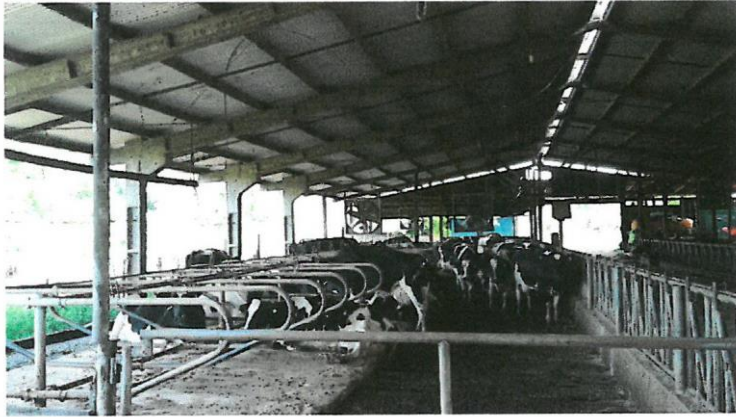


## Use of BioAktiv Liquid Manure in loose housing for dairy cows

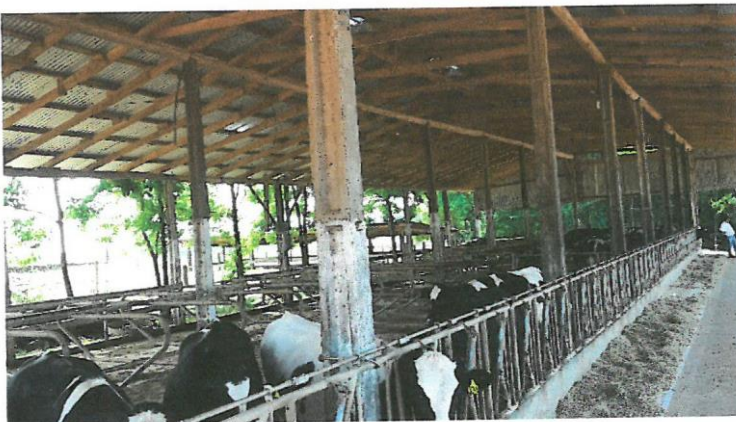
BioAktiv was also used in dairy cattle housing (Holstein cattle) at Fazenda Vilanova in the state of Rio Grande do Sul/Brazil. Of the two sheds, the main one houses 75 dairy cows. It has two wings, each with a liquid manure tank holding about 140 m<sup>3</sup>. The second house accommodates 29 heifers, the capacity of the liquid manure tank is 100 m<sup>3</sup>.



Main house, wing 1



Main house, wing 2

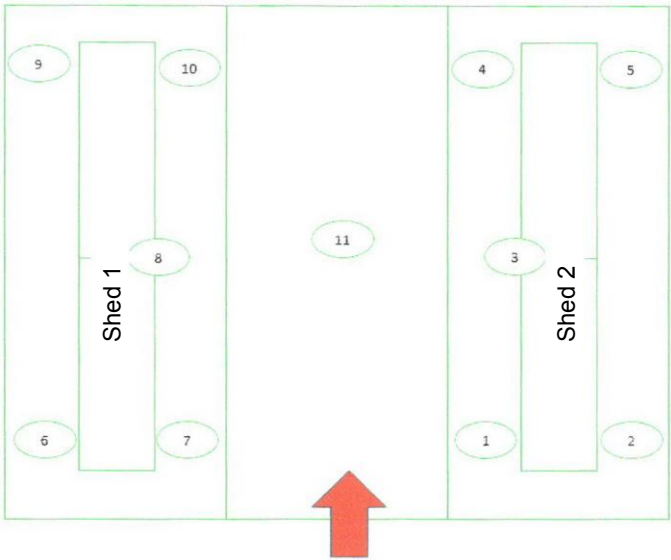


Heifer house (2nd shed)

To measure ammonia concentrations inside the sheds 11 measuring points were selected in house 1 and 6 measuring points in house 2. These were distributed as follows:

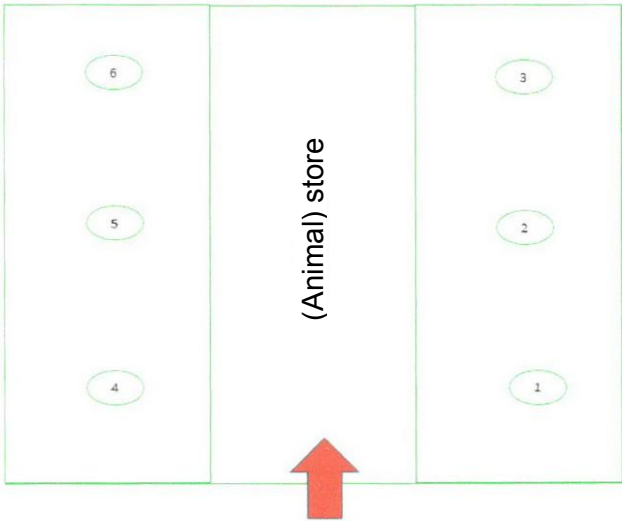
BioAktiv

House I



Ammonia measuring points house I

House 2



Ammonia measuring points house I

Here measurements were taken every 7th day before BioAktiv was applied, the aim being to determine the actual condition of ammonia concentration in the air of a shed. After BioAktiv use on Oct. 25, 2014 it was again applied on Nov. 24, 2014. Following the first application measurements were taken at intervals of 7 days. To add BioAKTIV to liquid manure tanks, 1 kg for each wing of house I was dissolved in 200 l of water, a ratio which was also used for house II. Apart from the treatment of slurry, BioAktiv for Animal Feed was added to concentrate at a rate of 1.5 g per animal and day.

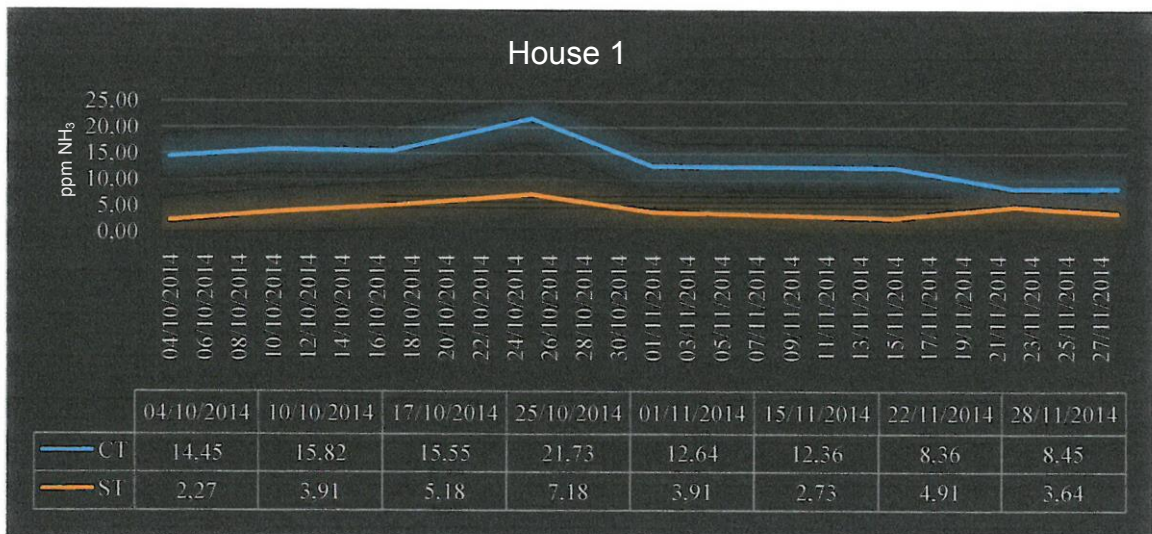


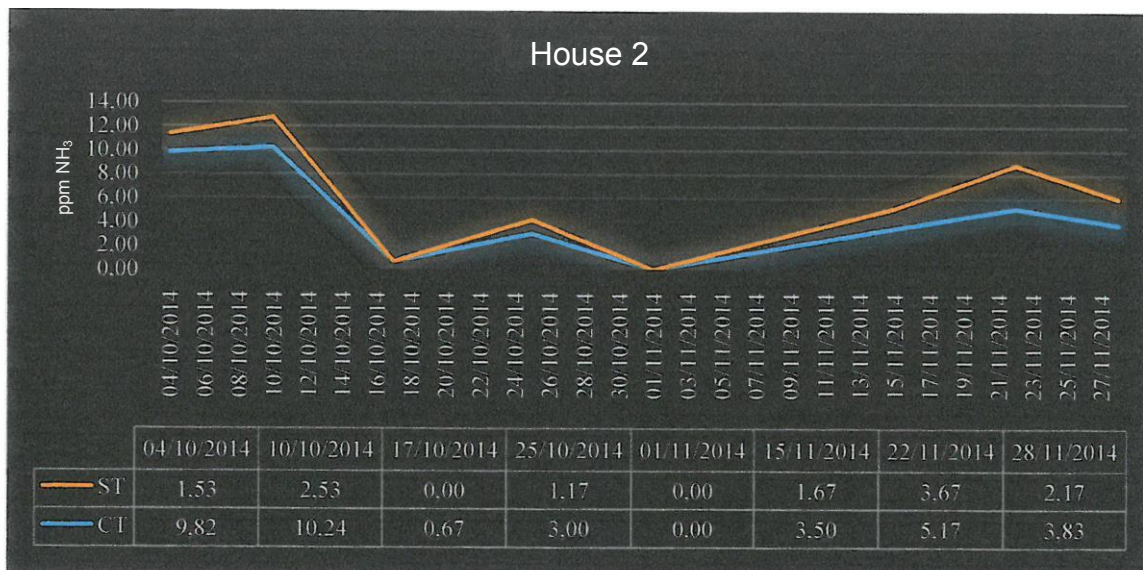
Ammonia readings are shown in the table:

		Oct. 4, 2014		Oct. 10,2014		Oct 17, 2014		Oct. 25, 2014		Nov. 1, 2014		Nov.15,2014		Nov. 22, 2014		Nov. 28, 2014		
Place	Meas. pt.	with	without	with	without	with	without	with	without	with	without	with	without	with	without	with	without	
		tube	tube	tube	tube	tube	tube	tube	tube	tube	tube	tube	tube	tube	tube	tube	tube	tube
		ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
		Ammonia	Ammonia	Ammonia	Ammonia	Ammonia	Ammonia	Ammonia	Ammonia	Ammonia	Ammonia	Ammonia	Ammonia	Ammonia	Ammonia	Ammonia	Ammonia	Ammonia
Ho use I	1	4	0	12	3	0	0	28	7	0	0	5	1	15	10	6	2	
	2	0	0	3	0	0	0	8	4	0	0	4	4	0	0	0	0	
	3	28	1	4	0	16	14	15	3	1	0	8	3	22	6	23	6	
	4	11	0	19	4	30	6	22	6	8	0	14	1	10	8	22	11	
	5	0	0	1	0	11	6	10	6	9	0	7	4	5	3	2	0	
	average	8.6	0.2	7.8	1.4	1.4	5.2	16.6	5.2	3.6	0.0	7.6	2.6	10.4	5.4	10.6	3.8	
2	6	0	2	12	2	1	1	10	5	0	0	7	2	8	8	5	0	
	7	8	3	23	5	14	5	9	5	11	3	4	1	2	0	0	0	
	8	11	0	4	4	4	4	32	16	25	3	3	0	4	0	6	3	
	9	87	12	86	19	83	11	92	18	79	36	75	9	20	14	23	13	
	10	5	2	10	6	12	10	13	9	6	1	9	5	6	5	6	5	
	average	22.2	3.8	27	7.2	22.8	6.2	31.2	10.6	24.2	8.0	19.6	3.4	8	5.4	8	4.2	

3	11	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	average	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
average		14.5	2.3	15.8	3.9	15.5	5.2	21.7	7.2	12.6	3.9	12.4	2.7	8.4	4.9	8.5	3.6	
House II	4	21	0	0	0	0	3	0	1	0	0	0	0	0	0	0	0	0
		22	0	0	0	0	0	0	5	0	0	0	8	0	10	8	3	2
		23	0	0	0	0	0	0	7	7	0	0	0	0	7	7	0	0
		average	0	0	0	0	1	0	4.3	2.3	0	0	2.6	0	5.6	5	1	0.6
5	1	5	1	0	0	0	0	0	0	0	0	5	4	9	5	14	6	
	2	3	0	0	0	1	0	0	0	0	0	8	6	5	2	6	5	
	3	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	
	average	2.7	0.3	0.0	0.0	0.3	0.0	1.7	0.0	0.0	0.0	4.3	3.3	4.7	2.3	6.7	3.7	
Ø general		<b>9.8</b>	<b>1.5</b>	<b>10.2</b>	<b>2.5</b>	<b>0.6</b>	<b>0.0</b>	<b>3.0</b>	<b>1.1</b>	<b>0.0</b>	<b>0.0</b>	<b>3.5</b>	<b>1.6</b>	<b>5.1</b>	<b>3.6</b>	<b>3.8</b>	<b>2.1</b>	

Measuring results are shown in the following diagrams:





**Please note that in house 1 BioAktiv application has reduced ammonia concentrations in the ambient air by some 20 %. This difference has also been found in the 4 measurements which followed BioAktiv application.** House II showed no such results as ammonia concentration after BioAktiv application reached about 0 ppm but started to rise again later but not to the levels that existed before the use of BioAktiv Liquid Manure and Animal Feed.