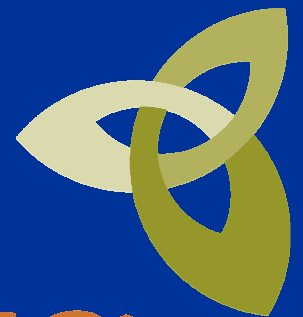




Methane to Markets

The Kindersley Centre, Berkshire

November 29th & 30th 2006



defra

Department for Environment
Food and Rural Affairs

ANAEROBIC DIGESTION IN ARGENTINA



The type of technology has to be adapted to different regions

mente onduladas.
porobolus indicus.

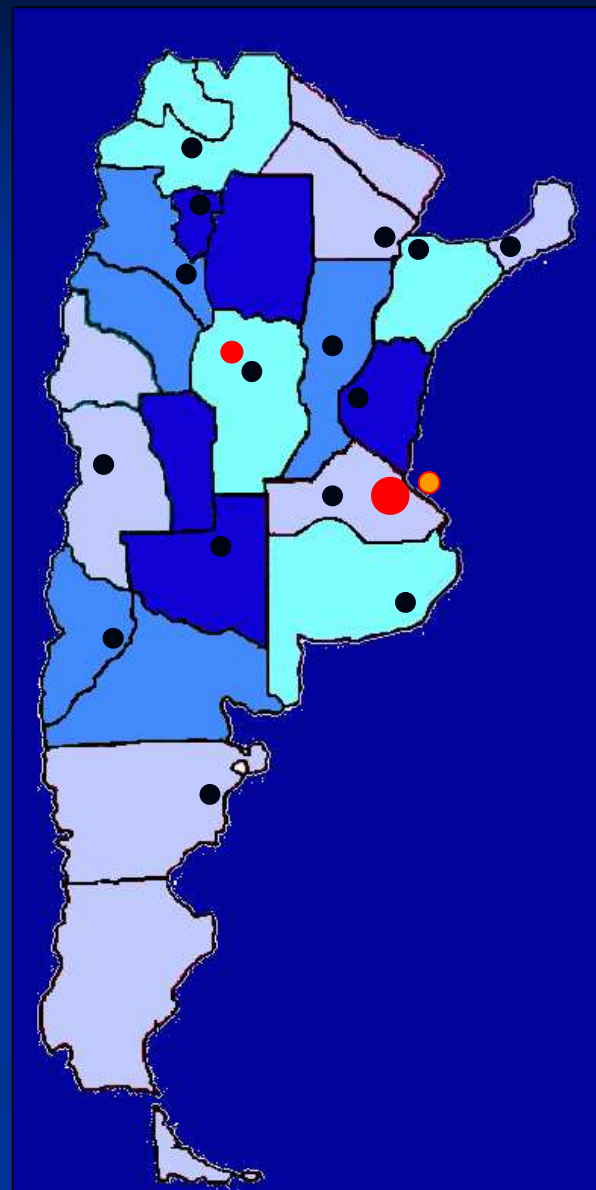


- Central office ●
- 15 Regionales centres ●
- 47 Experimental stations
- 3 Research Centres ●
- 13 Research Institutes ●
- 240 Extensión units
- 9 Innovative Technology parks
- INTA Group:

ArgenINTA foundation

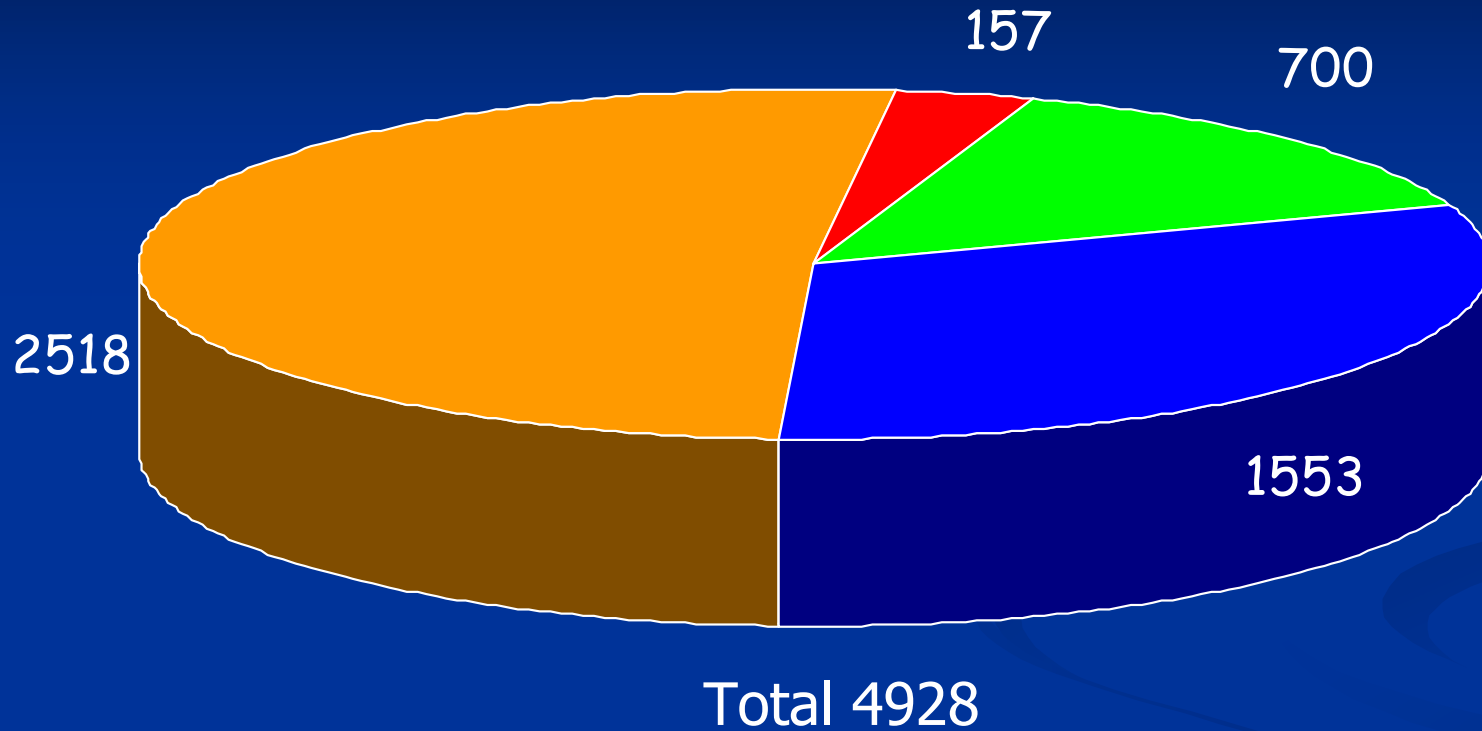
INTEA S.A.

Asociaciones Cooperadoras





HUMAN RESOURCES



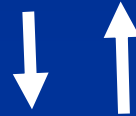
- Profesionales
- Asistentes
- Scholarships
- External Prof

El 41% de los profesionales INTA posee nivel de postgrado (maestría/doctorado)



NATIONAL NETWORK PROJECT
Energy production and final residue
treatment.
(AEAI2)

Biological and no biological energy



Agricultural production



Residue treatment

Principal problems to be achieved regarding sustainability

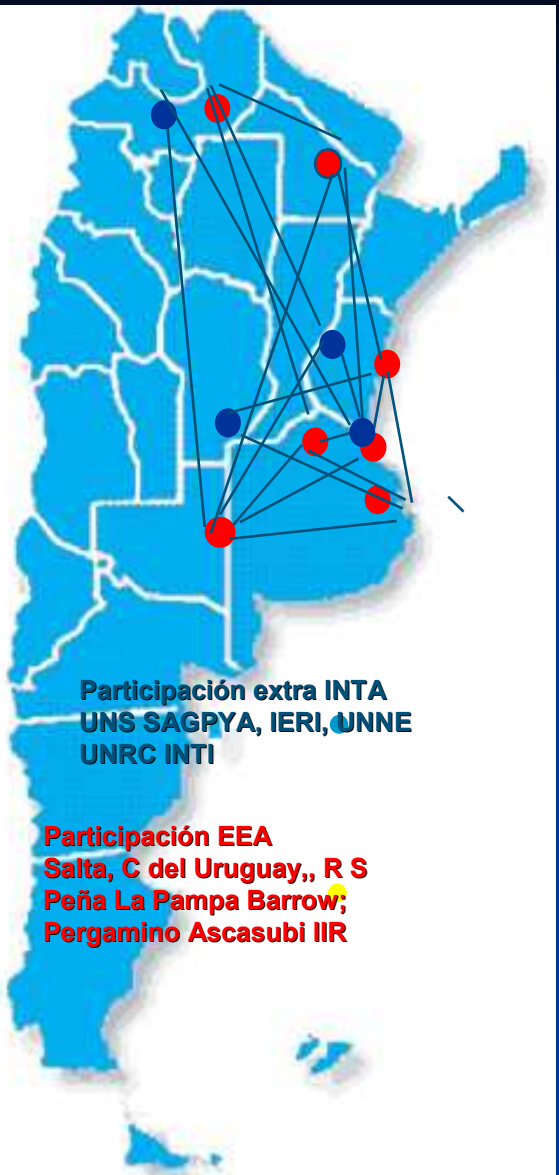
Degradation of soil and air: emissions



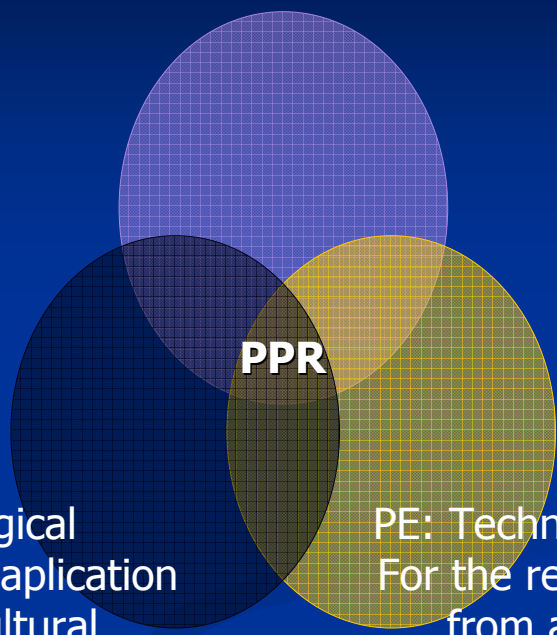
Energy production and residue treatment



Energy security: prices and available



PE: Vegetable and animal resources use for the production of biofuels



PE: No biological
 renewable energy application
 For the agricultural
 and agroindustrial sector

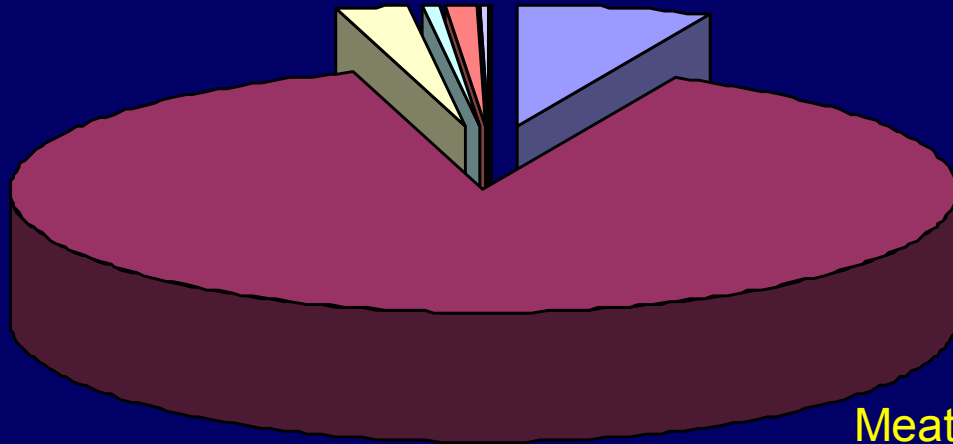
PE: Technology development
 For the reduction of pollution
 from agronomical and
 Agroindustrial activities

METHANE EMISSION FROM ENTERIC FERMENTATION - 2000

SHEEP GOATS POULTRY HORSES
SWINE MULES AND ASSES

4%

Dairy cattle
7%



Meat prod
cattle
89%

EMISSION CH₄ ENTERIC FERMENTATION 2000



CATEGORY	EMIS/ANIM kg/cab/año	ANUALPOPULATION (cab)	EMIS. CATEG. (Tn/año)
DAIRY CATTLE		2.000.000	183.575,172
Lactantes y gestantes	111,50	928.000	103.473,03
Lactantes y vacías	106,72	400.000	42.686,28
Secas y gestantes	58,42	272.000	15.889,22
Secas y vacías	53,82	400.000	21.526,63
NON DAIRY CATTLE		19.600.000	260.635,61
Lactantes y gestantes	73,17	7.350.000	537.806,26
Lactantes y vacías	68,44	3.675.000	251.521,19
Secas y gestantes	57,74	3.675.000	212.184,12
Secas y vacías	53,19	4.900.000	260.635,61
HEIFER		7.350.000	1.054.124,8
1 a 2 años recría	57,21	2.910.000	166.489,11
1 a 2 años invernada corta	52,81	1.500.000	79.218,78
2 a 3 años gestantes	72,52	1.800.000	130.539,21
2 a 3 años vacías	68,30	1.140.000	77.866,91
STEER		5.292.000	284.652,26
Invernada corta	55,80	2.000.000	111.602,15
Invernada larga	52,57	3.292.000	173.050,11
STEER Invernada larga	65,22	3.528.000	231.114,87
BULL	82,17	588.000	48.314,10
SMALL BULL	92,89	882.000	81.931,79
CALVES		11.760.000	167.420,74
Ternera Feddlot	34,43	630.000	21.695,25
Machos invernada corta	42,32	1.052.500	44.538,57
Machos invernada larga	38,78	866.250	33.595,94
Hembra recría	43,00	762.500	32.786,34
Hembra invernada corta	38,96	786.000	30.626,05
Ternero al pie	0,00	5.585.250	0
Ternero torito	53,92	77.500	4.178,59
		49.000.000	2.712.270,2

CH₄ and nitrogen oxide emissions

SHEEP GOATS POULTRY HORSES
SWINE MULES AND ASSES

→ **at field**

Dairy cattle



70% field

30% milking and waiting areas.
(Anaerobic lag)

Pigs



25% field

75 % confinement (anaer lag)

Poultry

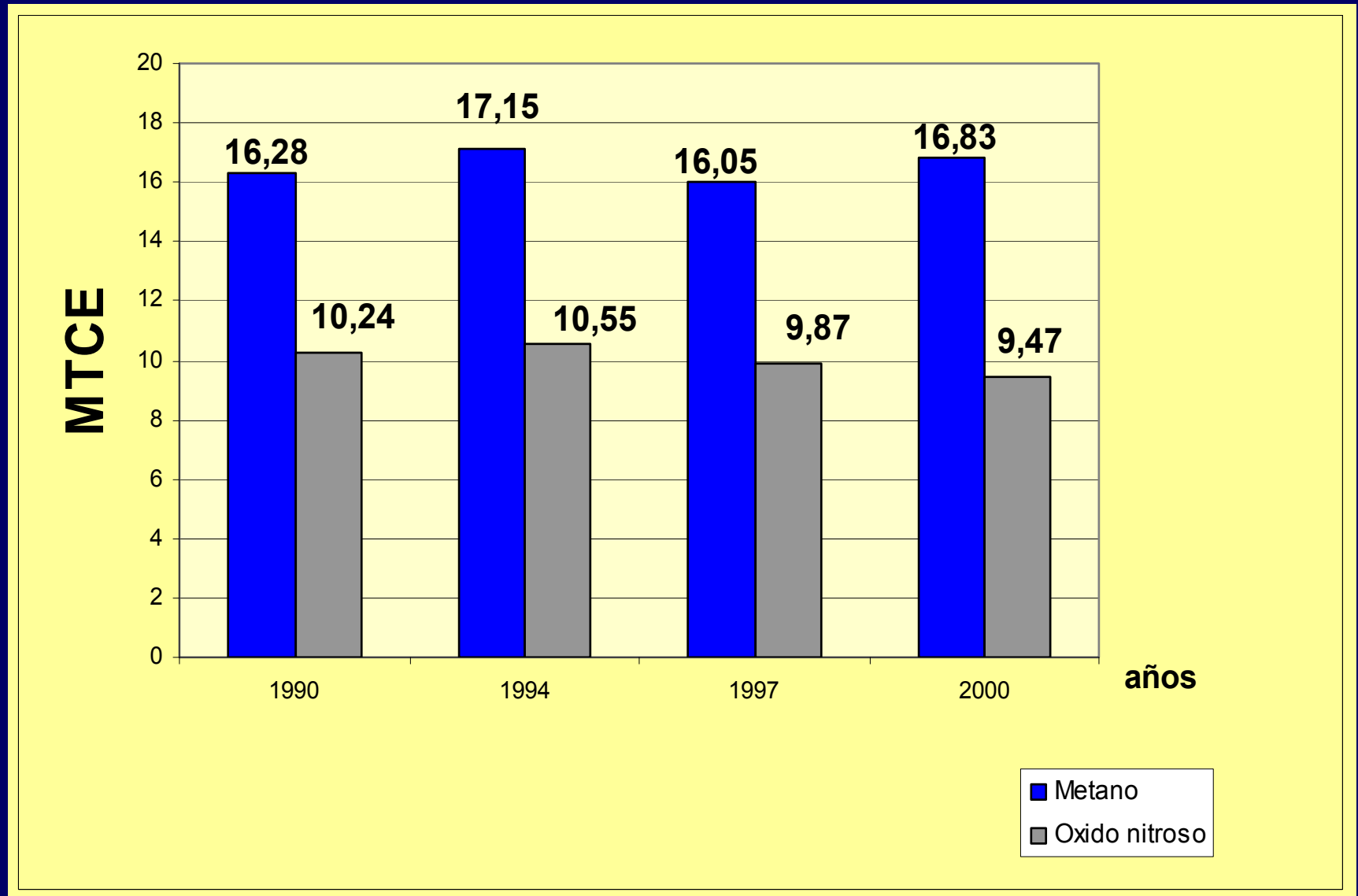


50% dry management

50% wet systems (anaer lag)

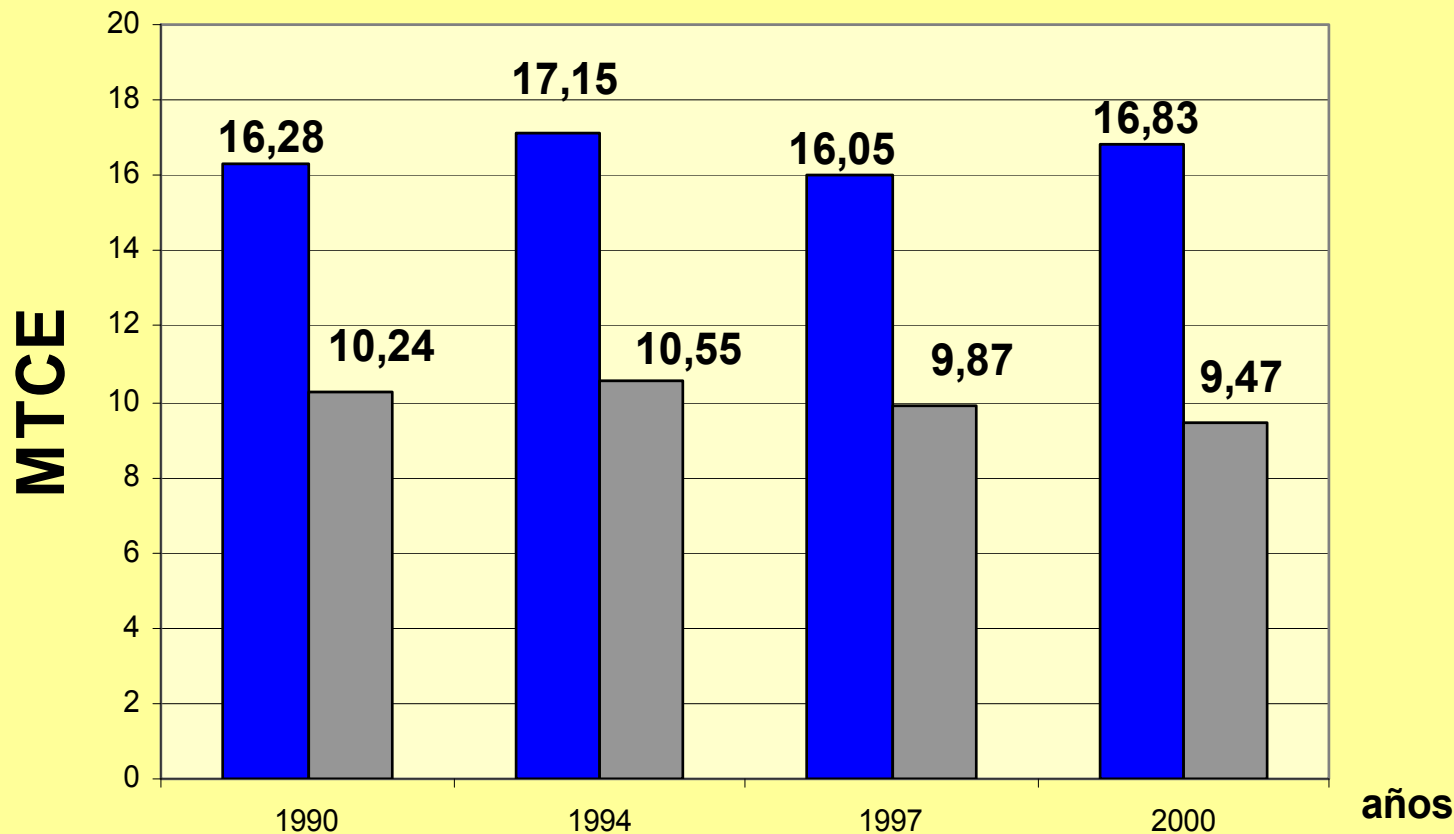
EMISIONES DE Gases de efecto Invernadero

Metano y Oxido nitroso

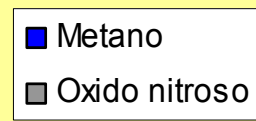


Emissions development- Greenhouse gases

1990 – 1994 – 1997 - 2000



Metano y Oxido nitroso



Present situation on dairy farms



*Big deposits with atmospheric emission
and pollution of small rivers*

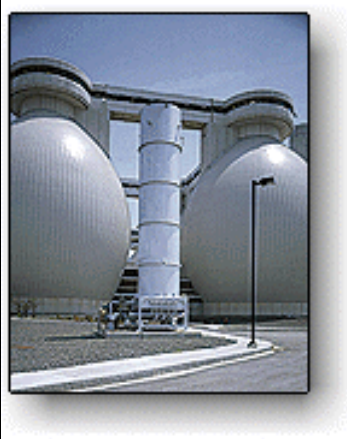


Present situation

- Methane emission
- Underwater pollution
- Insects and pests

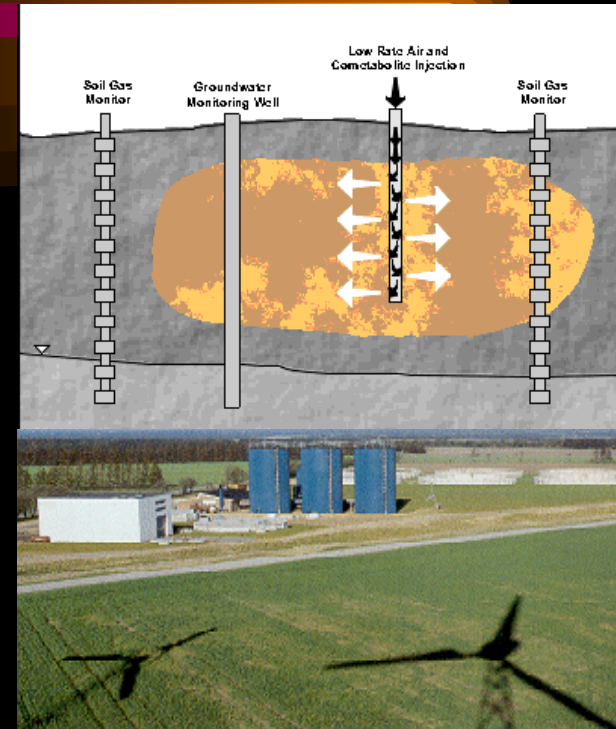


Anaerobic digestion in the new world scenario regarding energy and environment crisis has an important role to play

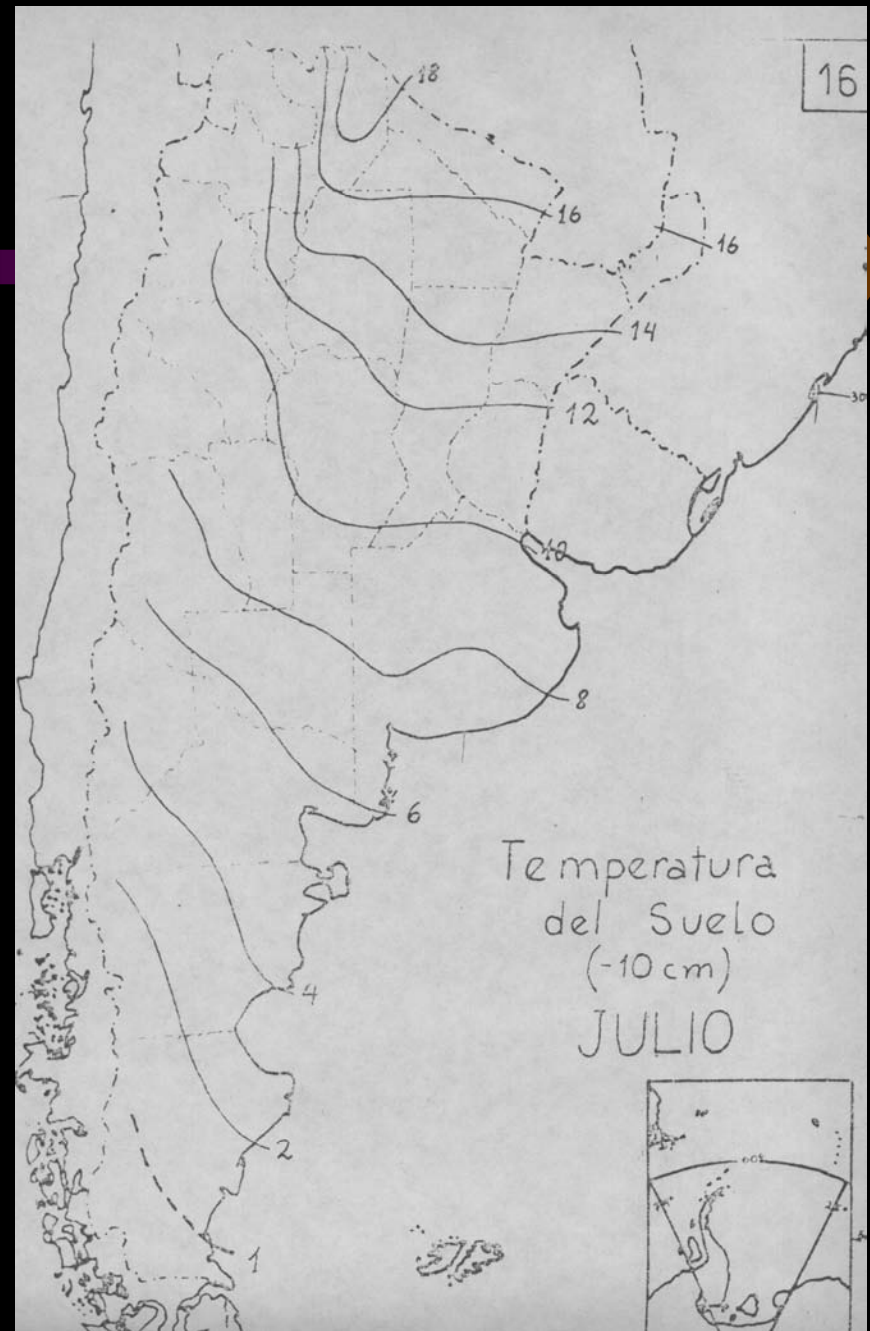


Fields

- City garbage treatments
- Agro industry
- Small rural plants
- Intensive agricultural productions
- Water treatment in cities



*Temperature is
one of the
important
factors to be
considered*



Research Digesters INTA Castelar

•Hindu type digester

Batch batteries 200 l
digesters

- 6 cubic meter capacity
- 10 years in operation
- Feeded with pig, cattle, horse and chicken manure
- Mean production 6 to 11 m³/day
- Temperature 36 to 40 °C
- Heating requirements 25 to 30 % of dairy production

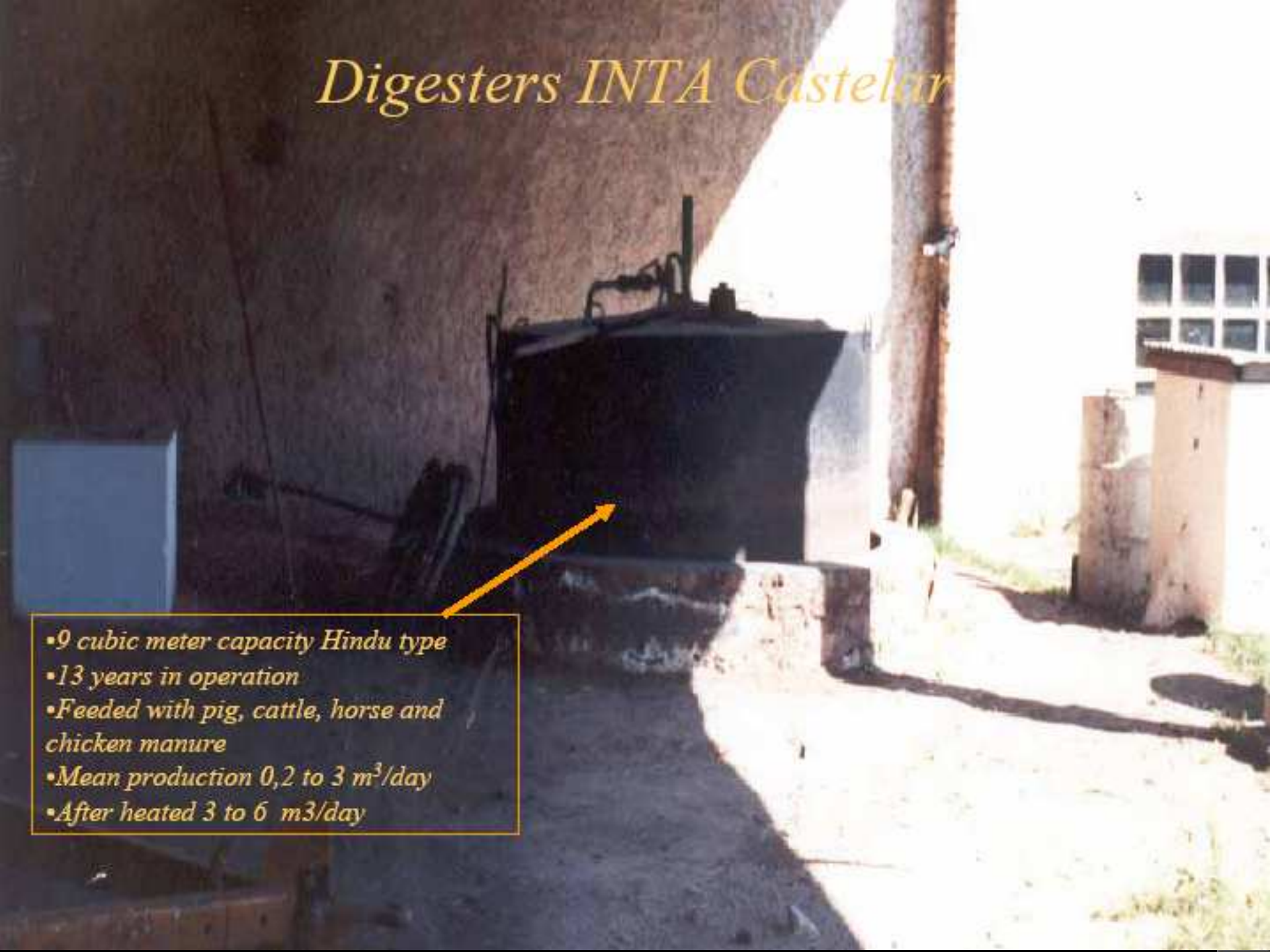
Digesters INTA Castelar



CONCERNS

- Insulation winter tem below 0 °C*
- Feeding and agitation requirements*

Digesters INTA Castellar

- 
- 9 cubic meter capacity Hindu type*
 - 13 years in operation*
 - Fedded with pig, cattle, horse and chicken manure*
 - Mean production 0,2 to 3 m³/day*
 - After heated 3 to 6 m³/day*

Batch digester INTA

- *Three chamber batch type digester*
- *High solid contents*
- *No insulation or heating*
- *Summer tem 14 – 17 winter 10 – 12 °C*
- *Mean production w 0,4 sum 2 m³/day*
- *Operational problems*





INTA

BIOGAS

DIRECTOR
DISCONTINUA

Dairy farm plant Suipacha Bs.As.

Dairy farm Suipacha Bs.As.

- *Two chambers cont digester 113 m³*
- *Low solid 2,1 %and temperature feed*
- *Dairy farm with 70 cows*
- *Heated mean temp 17 °C*
- *Mean production w 11 sum 16 m³/day*



FAO network digester agricultural school Chile



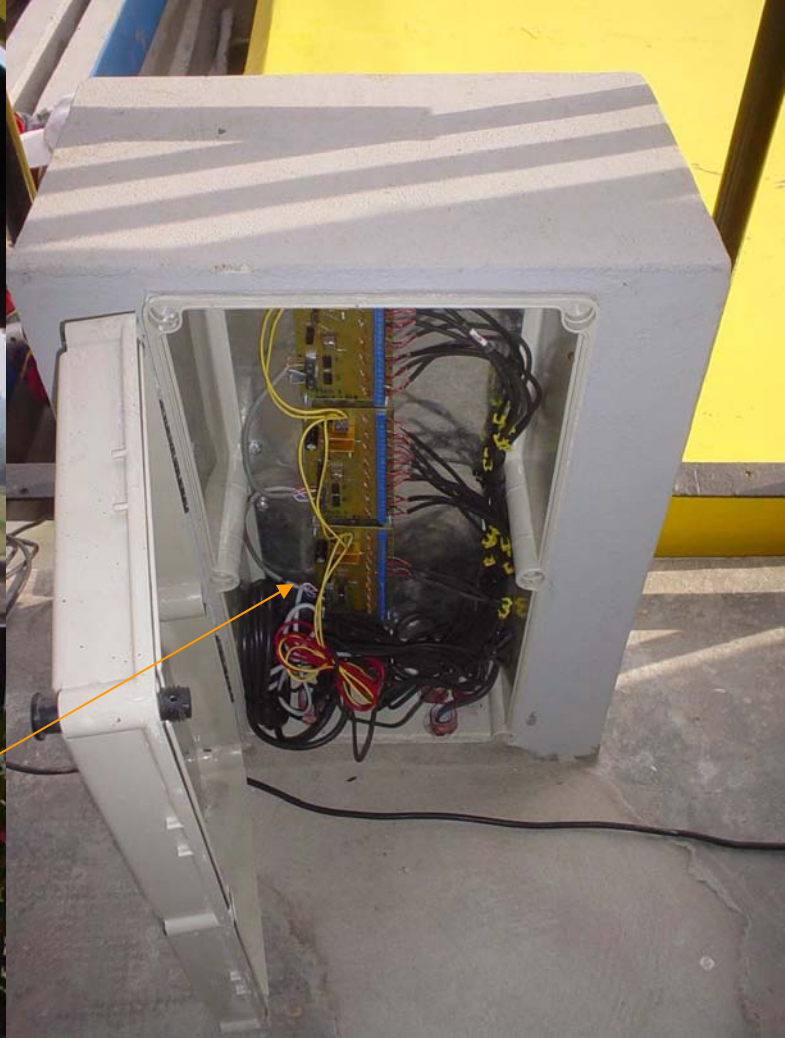
Agricultural School Chile FAO network

- *Cont digester 24 m³*
- *Good insulation*
- *Dairy farm and pigs*
- *Heated by biogas internal exchanger*
- *Mean production 16 m³/day*

Treatment plants INTA Castelar 2006

- *Scope small rural town organic residues*
 - *One chambers cont digester 12 m³*
 - *Three internal chambers*
 - *Electronic heating control*
 - *High solid urban feed*
- 





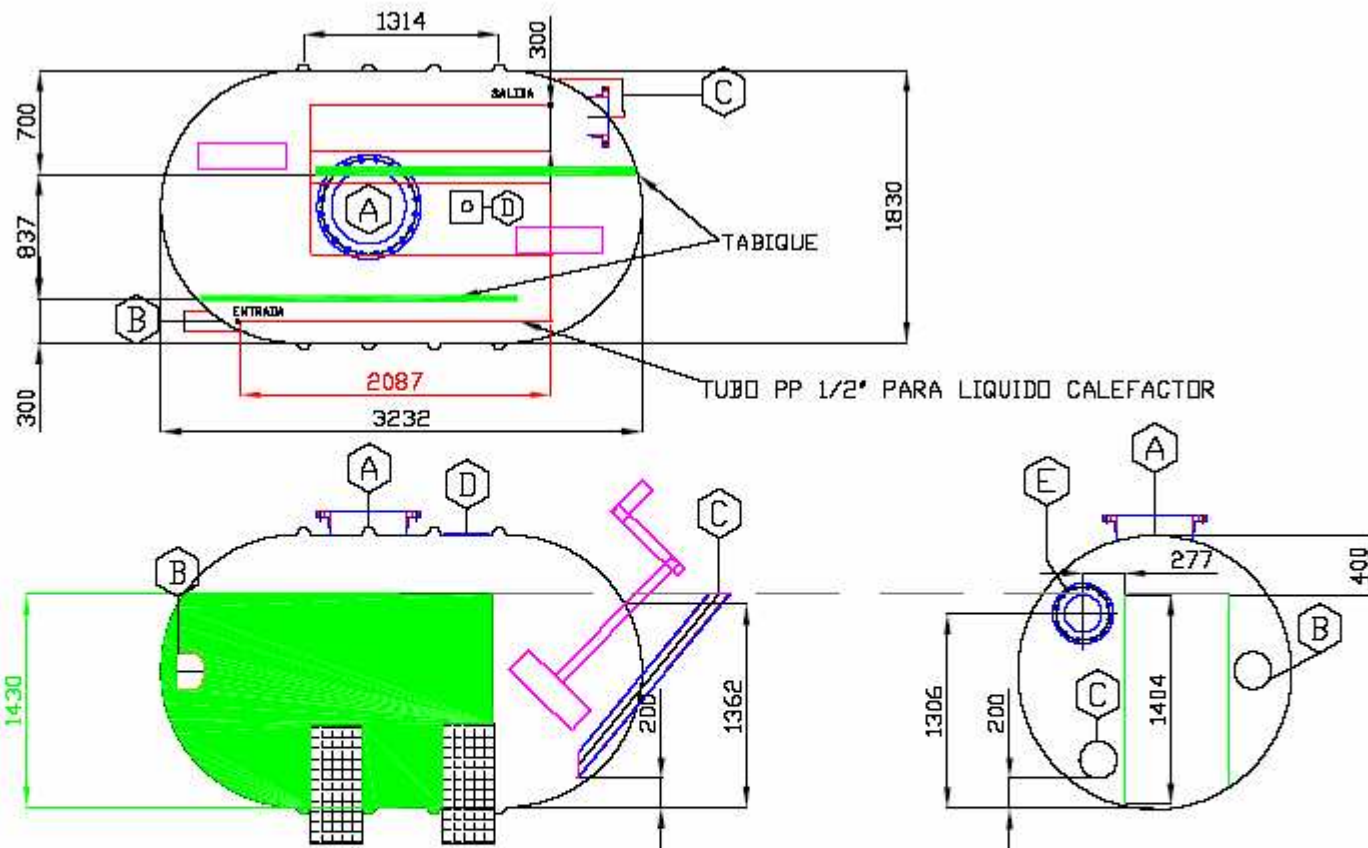








Reinforced plastic PHRVC digester for dairy farms



ESPECIFICACION DE CONEXIONES.

Denom.	Cant.	Diám.	SERIE	TIPO	SERVICIO
A	1	20"	---	---	BOCA DE INSPECCION CON BRIDA CIEGA
B	1	4"	PVC	BSP	ENTRADA DE PRODUCTO PVC
C	1	10"	PVC	BSP	SALIDA DE PRODUCTO PVC
D	1	2"	ROSC.	BSP	SALIDA DE GAS
E	1	10"	150#	FF	SALIDA DE LIQUIDO CON BRIDA CIEGA



TANQUE PARED UNICA - CAPACIDAD 6M3

FECHA:	07/08/08	DIBUJÓ: D.P.	APROBO: N.A.	Ppto N°: 737
ESCALA:	CLIENTE: INTA			PLANO N°: SWT-6-737
S/E	Revisión:			(F)

Reinforced plastic PHRVC digester for dairy farms



Rural community treatment plant Emilia S.Fe Argentina 2003



Emilia Santa anaerobic treatment plant

- Digester working on domestic organic waste.
- Horizontal plug flow design
- 700 a 800 kg per week mixed with 50 % of water..
- Feed chamber volume 1600 liters.
- Sólids 20 %.





Agro industrial sector

- Digester full mixed plant 1200 m³
- Production 140 m³/hour.
- Feed 140 m³/hour
- DQO 4000 ppm.
- Efficiency 1,2 m³ per m³ of sewage
- 15 % of energy needs





TOMA DE MUESTRA
MODULO A

CICSA
0007191

MB
PUESTO DE
INCENDIO
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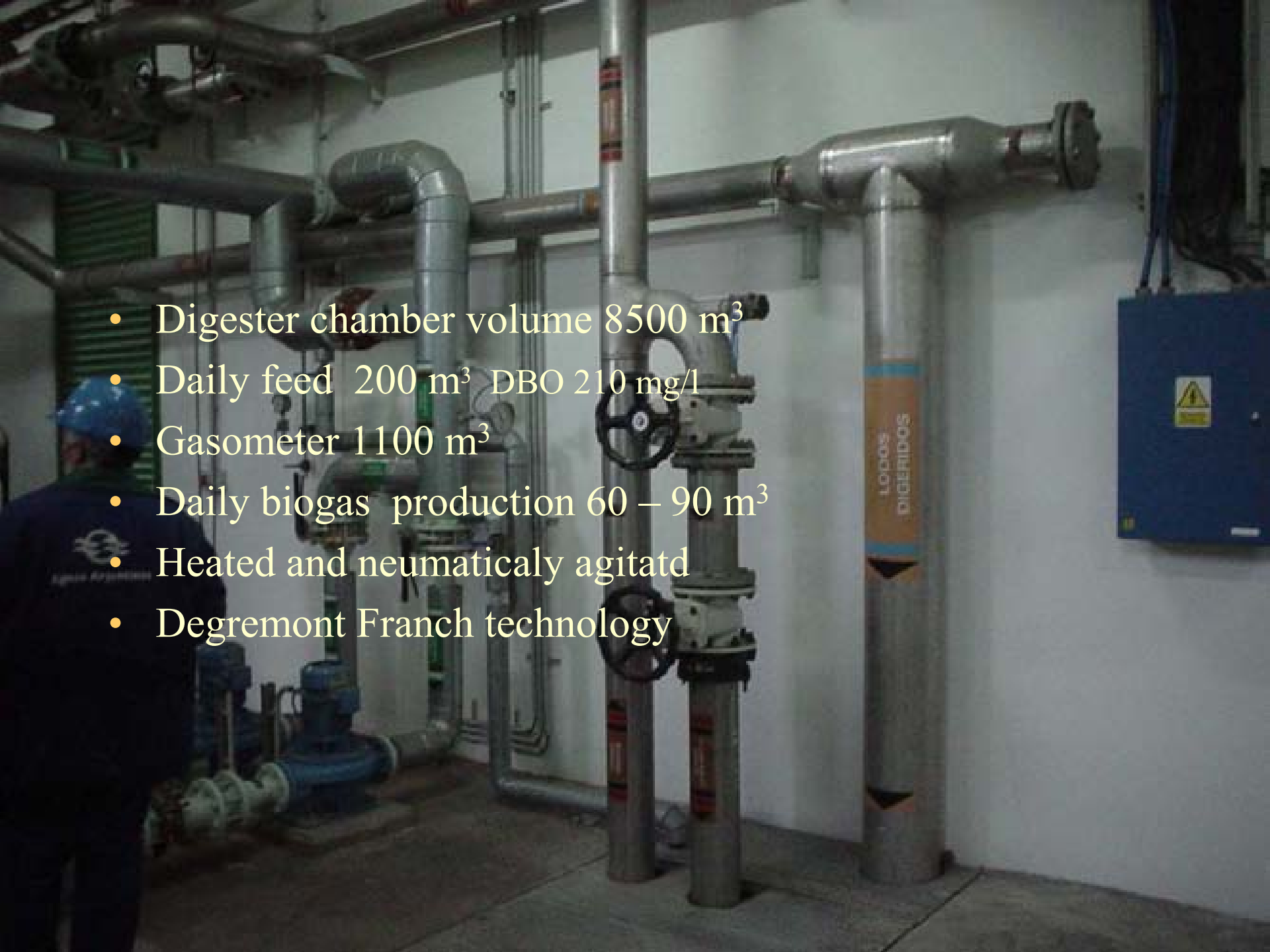


Milk industry whey treatment





Big scale anaerobic digestion

- 
- A photograph of an industrial facility, likely a wastewater treatment plant, showing a complex network of large pipes and machinery. A worker in a blue hard hat and dark uniform is visible on the left. The pipes are painted grey and some have orange and blue markings. A blue electrical control panel is mounted on the wall to the right. The text is overlaid on the left side of the image.
- Digester chamber volume 8500 m³
 - Daily feed 200 m³ DBO 210 mg/l
 - Gasometer 1100 m³
 - Daily biogas production 60 – 90 m³
 - Heated and pneumatically agitated
 - Degremont French technology







New trends and opportunities of cooperation

- There are increasing number of projects related to biogas recovery in landfills
- There are several projects regarding anaerobic treatment of solid wastes in small rural towns.
- There is an increasing interest in the industry

Opportunities of cooperation

- Systems related with heat and electrical use of biogas
- Secondary fuels development from biogas
- Digesters technology appropriate for temperate and cold climates

Thank you !!!

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