

Welcome to the biggest
farmer **biogas** network!



Get the most out of your
biodigester!

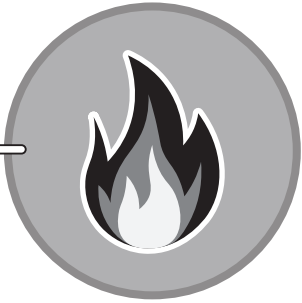
USER MANUAL



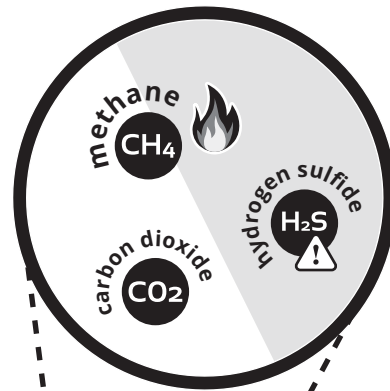
SISTEMA.bio[®]
CREATING VALUE FROM WASTE

Understanding your biodigester

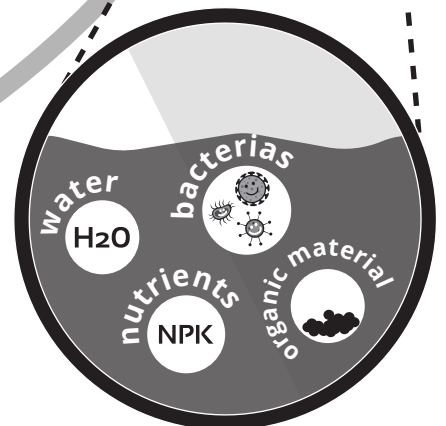
Energy = Biogas



Waste = Biodigester feeding



Nutrients = Biofertilizer



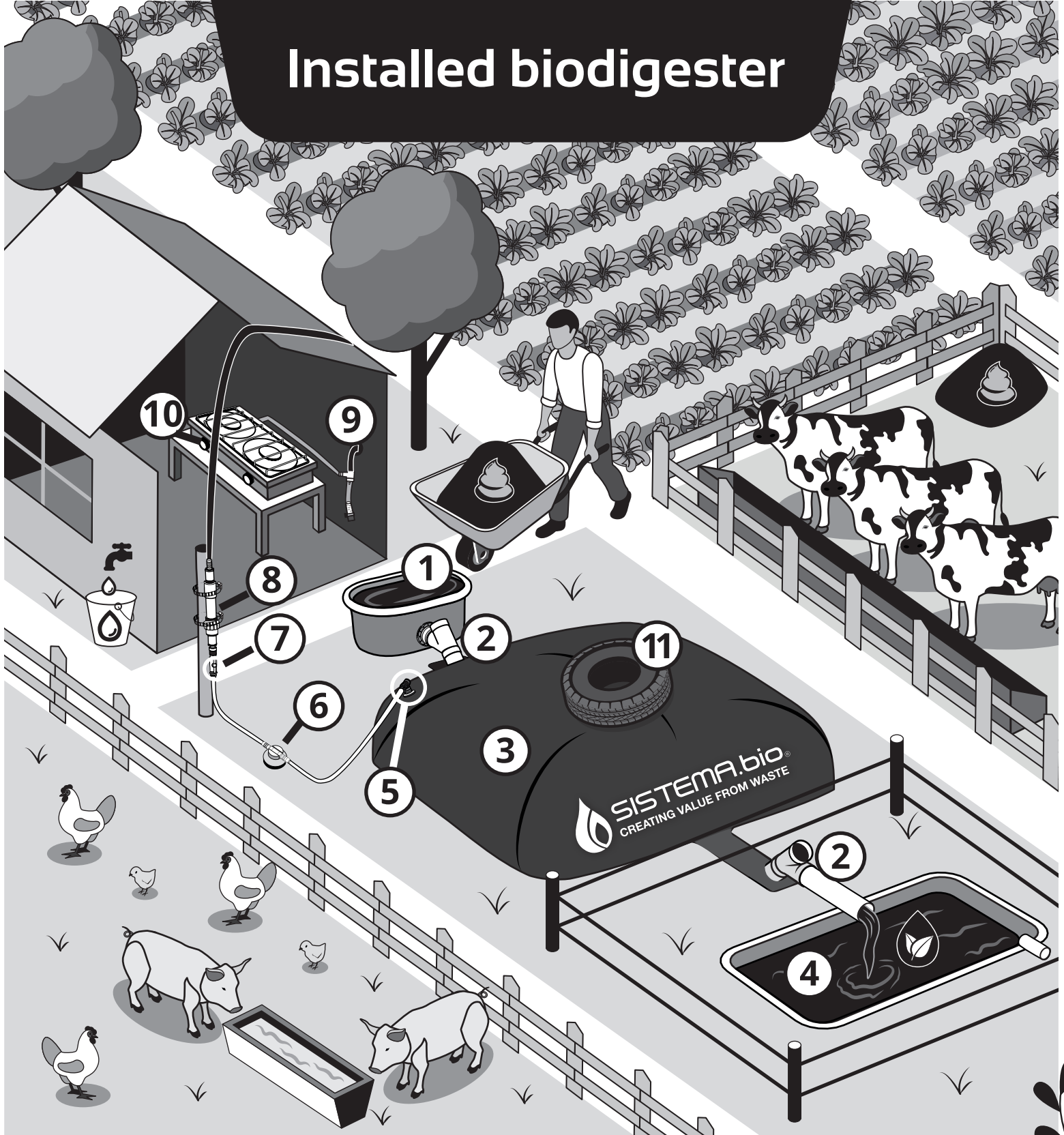
Index

Installed biodigester.....	2
Biodigester functional components.....	3
Safety.....	5
Biodigester.....	5
Biofertilizer.....	6
Biogas.....	7
Biodigester startup.....	9
How to use your system.....	13
Maintain your digester.....	13
Biodigester productivity.....	16
Biogas Usage.....	17
Biofertilizer Usage.....	20
Maximize the biodigester’s benefits.....	21
Spare parts.....	23
Biodigester specifications.....	24
Basic troubleshooting.....	25
Disposal.....	31
Details to keep in mind.....	31
Notes.....	32
Safeguarding at Sistema.bio.....	33
Contact information.....	34

Note for technicians and trainers:

- On the day of installation, train the user on the contents from pages 2 to 12.
- On the day of commissioning, train the user on the entire manual.

Installed biodigester



Know the **elements** of your installation

1. Feeding tank
2. Inlet and outlet reactor piping
3. Reactor
4. Biofertilizer tank

5. Biogas outlet
6. Pressure relief valve
7. Isolation valve
8. Biogas filter

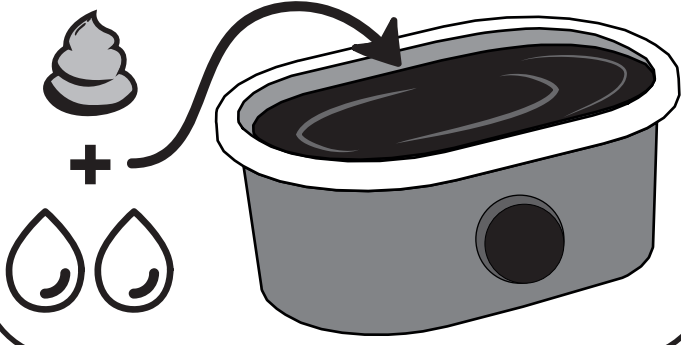
9. Water trap
10. BioStove
11. Counterweight

Note: Components might differ depending on the region and the local context of the project.



Biodigester functional components

1 Feeding tank: Long-lasting tank that allows you to mix dung and water. It also helps you identify and remove unwanted elements.

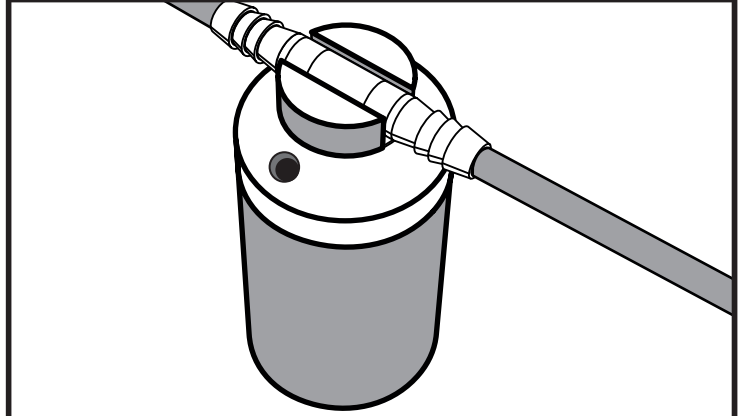


4 Biofertilizer tank: It allows you to store your biofertilizer before using it!

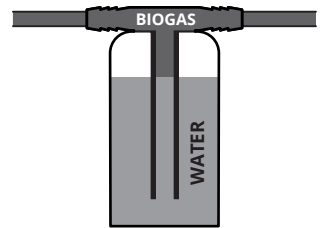


NOTE: All these components require regular operation and maintenance actions as explained later in the manual! Components might differ depending on the region and the local context of the project.

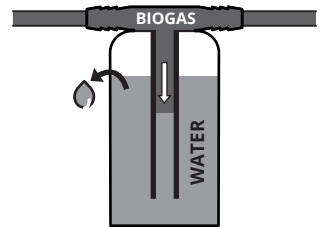
6 Pressure relief valve (PRV): It controls the pressure in the biodigester using water for counter-pressure.



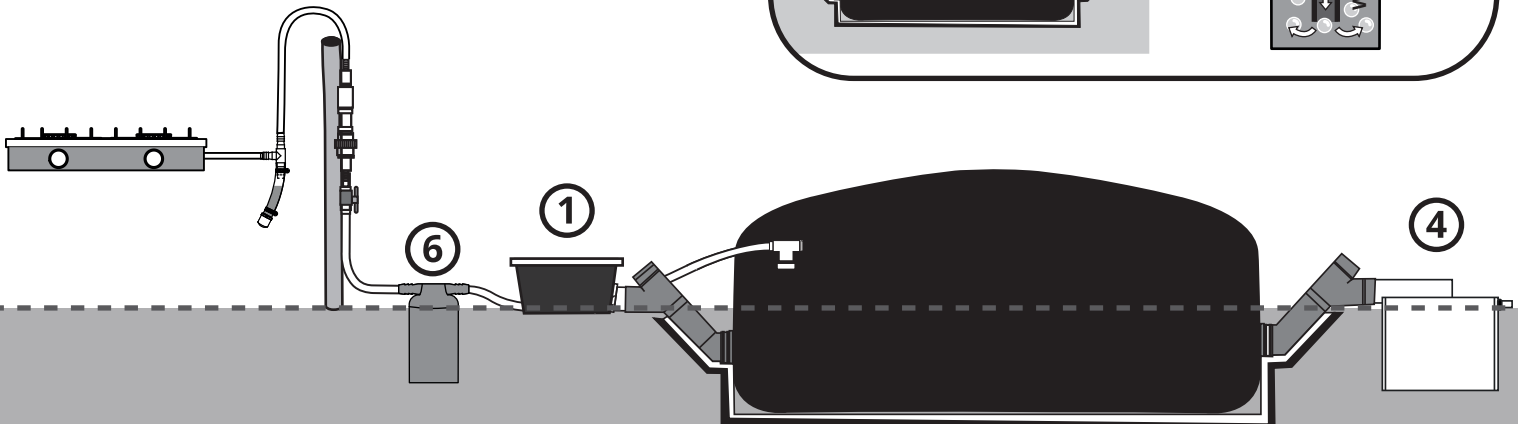
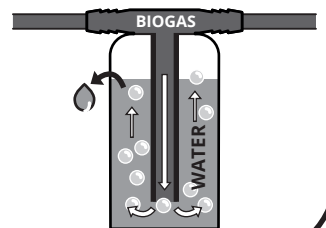
a. LOW PRESSURE



b. PRESSURE INCREASE

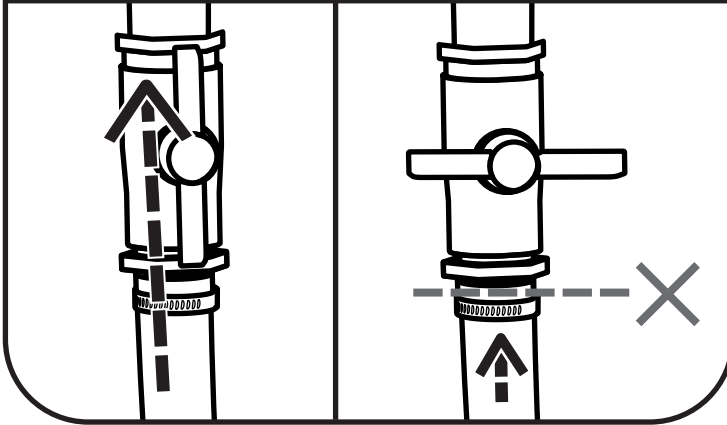


c. HIGH PRESSURE

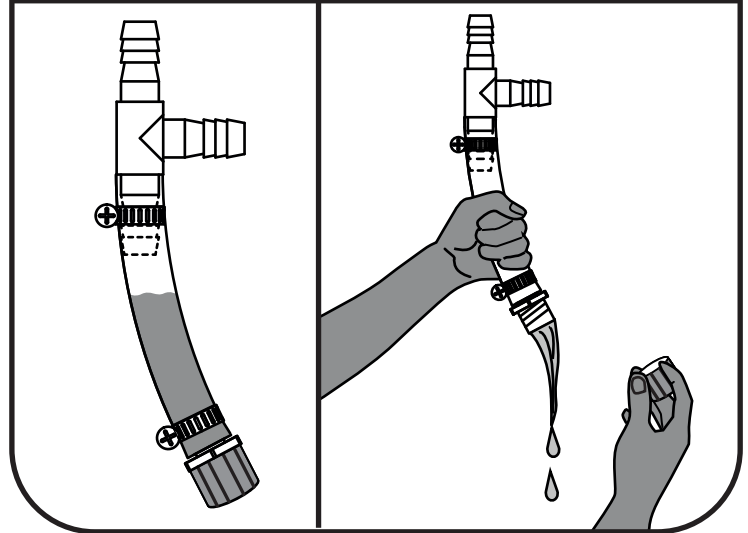




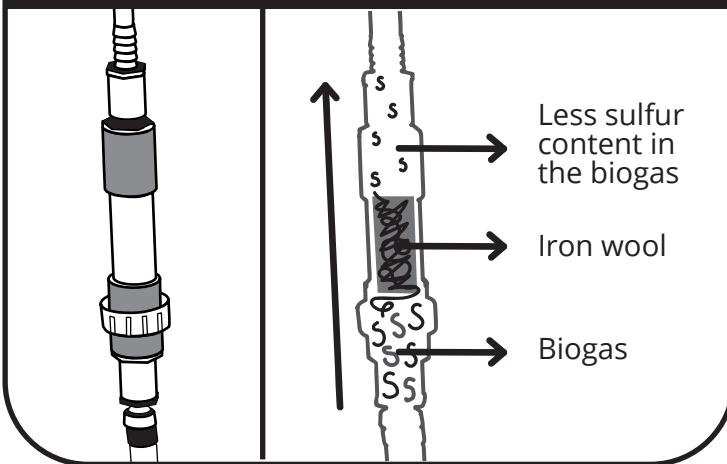
7 Isolation valve: It allows you to close and stop the biogas flow.



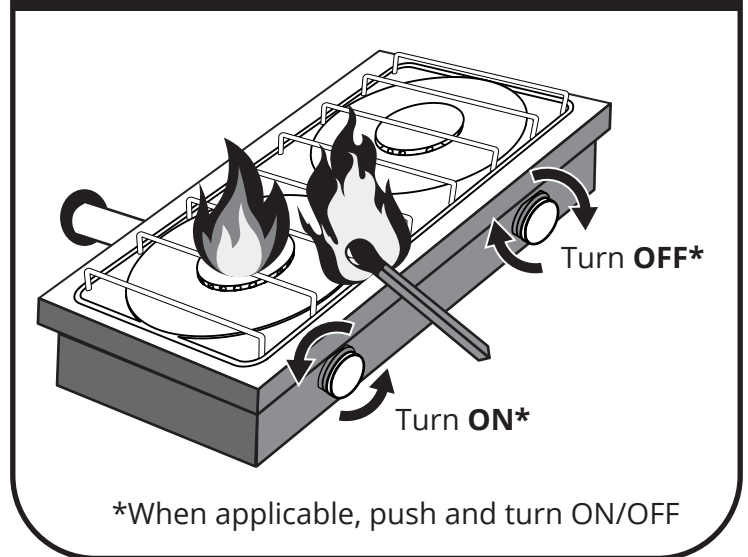
9 Water trap: When the temperature drops, the water in the biogas condensates and is collected by the water traps.



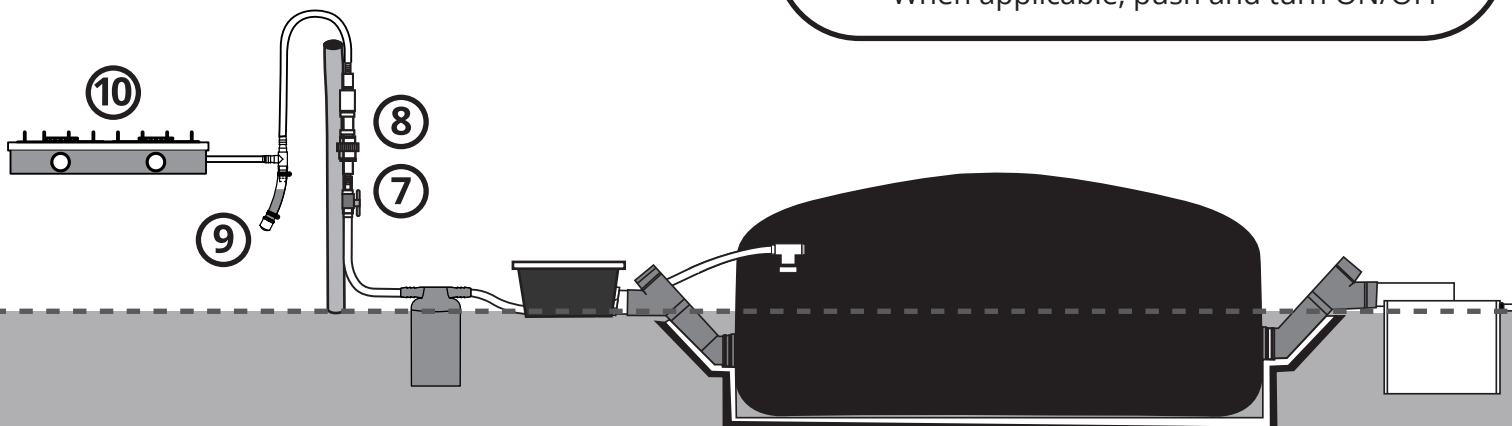
8 Biogas filter: Reduces the smell and the sulfur content of the biogas. It increases the lifespan of all metallic biogas appliances.



10 BioStove: Appliance included in the standard kit.



NOTE: All these components require regular operation and maintenance actions as explained later in the manual! Components might differ depending on the region and the local context of the project.





Safety

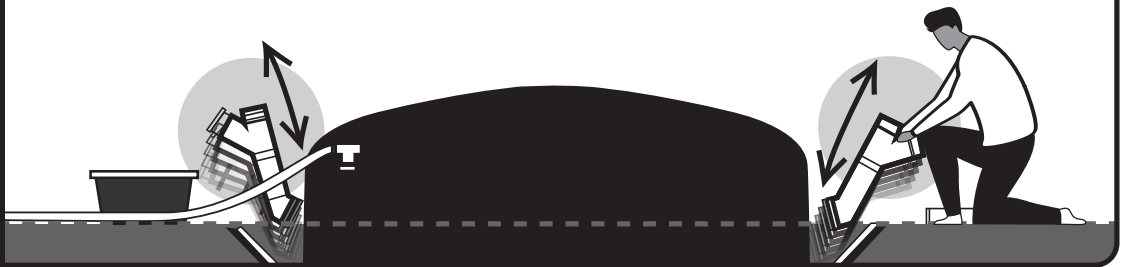
Biodigester



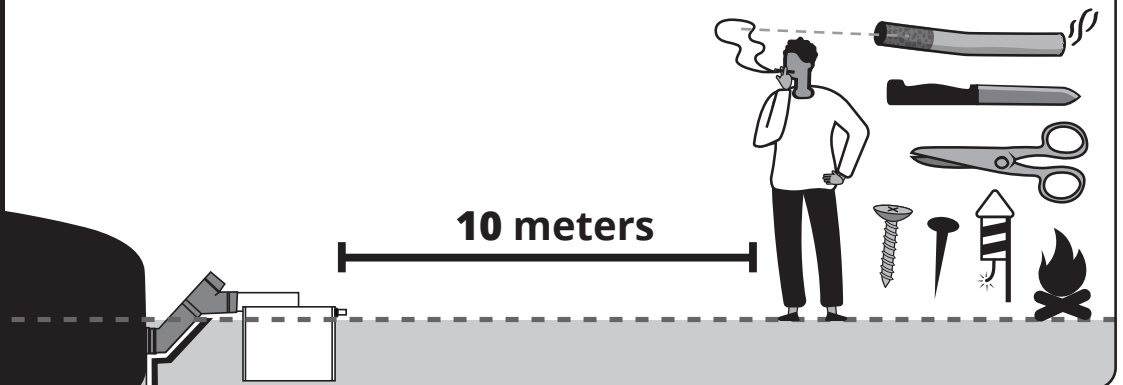
DO NOT allow unattended children around the digester, **DO NOT** jump on or run on the digester.



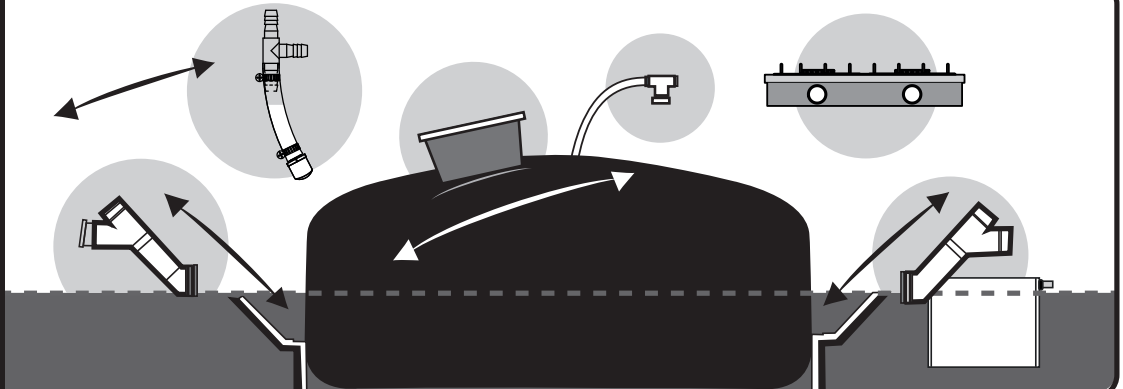
DO NOT pull, lift or raise the level of the pipes that enter or exit the digester.



DO NOT smoke, use sharp objects or create flames near the biodigester area.



DO NOT change the position of the biogas components.

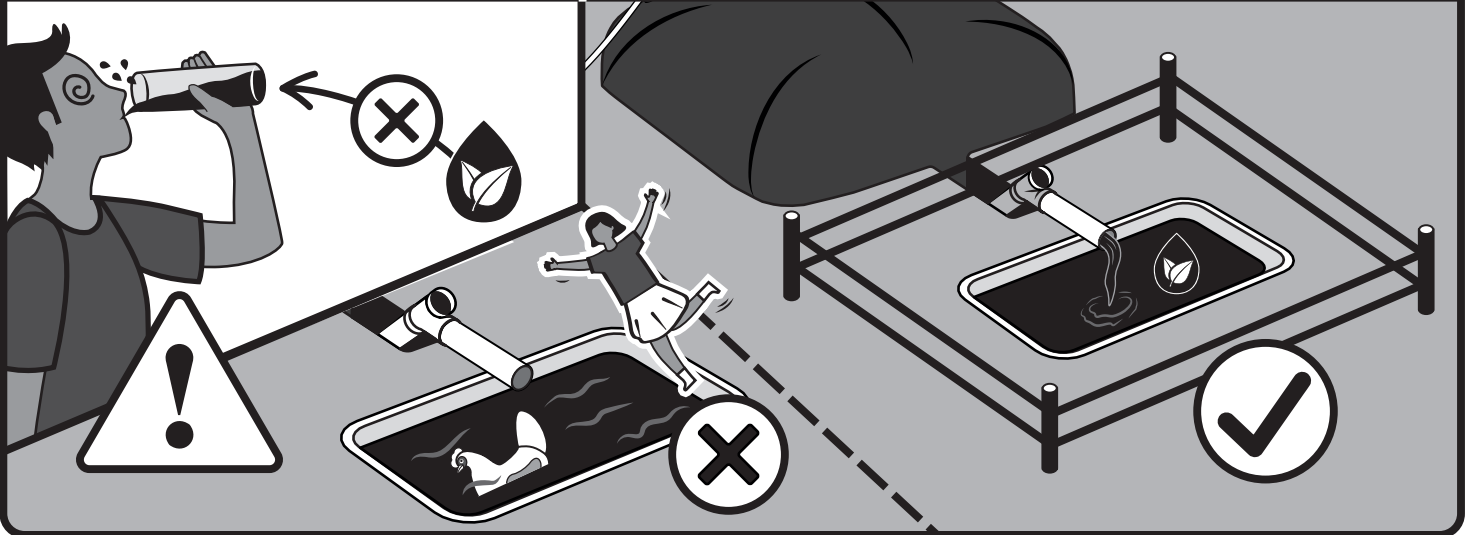




DO NOT drink the biofertilizer, avoid direct contact with eyes and skin.



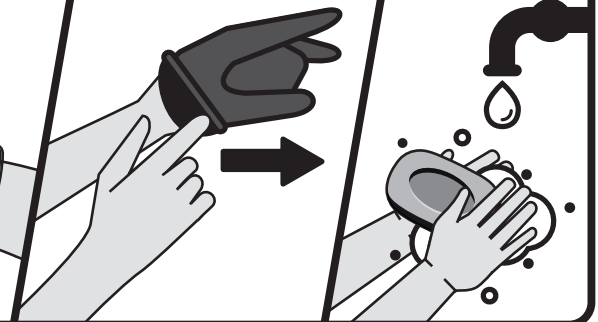
Add a fence around your biofertilizer tank to prevent accidents.



1. Use gloves for handling manure and biofertilizer.



2. Wash your hands after handling.



1. STOP applying biofertilizer **3 weeks before** harvesting.

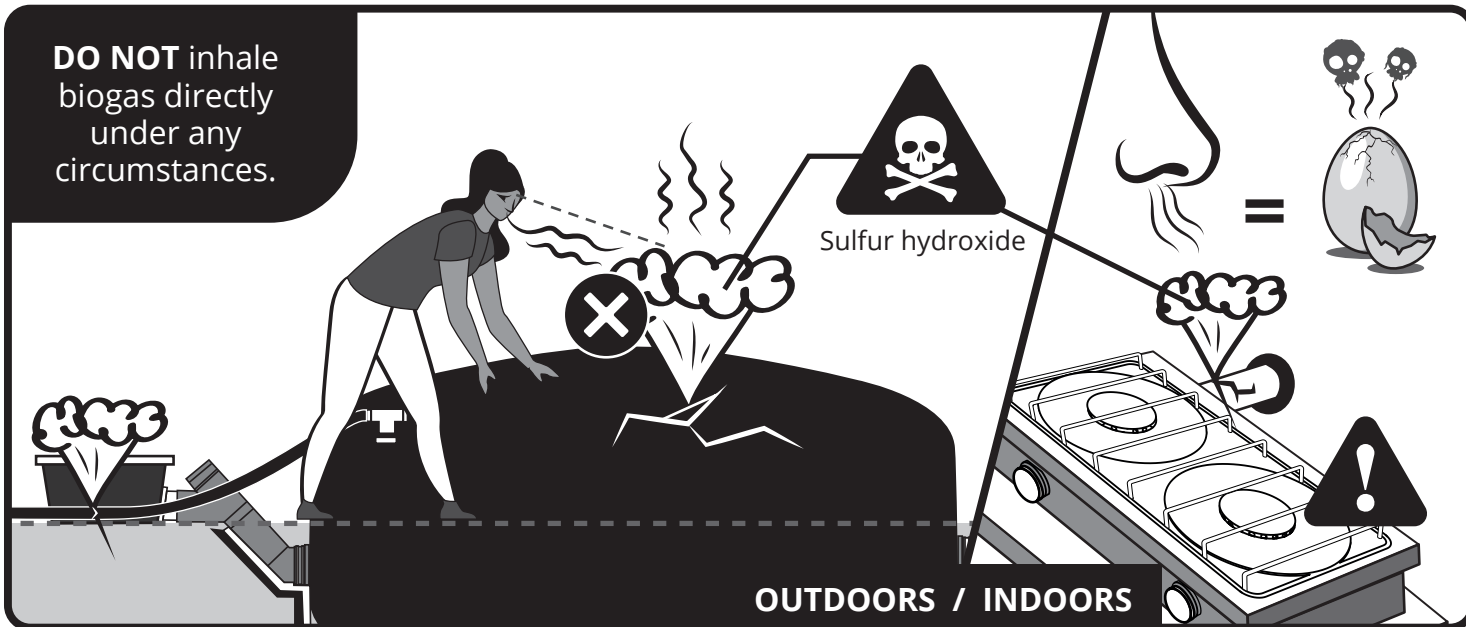
2. WASH fruits and vegetables before eating.





Biogas

DO NOT inhale biogas directly under any circumstances.



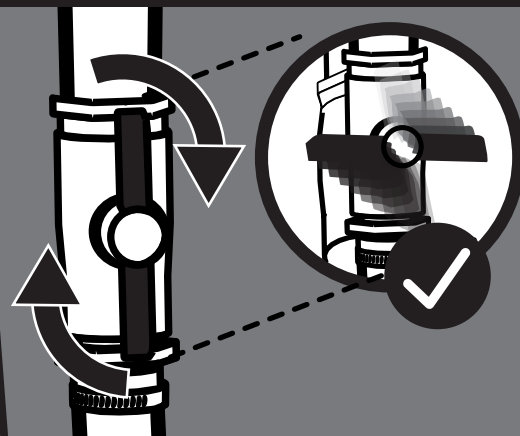
1. A biogas leak will smell similar to **ROTTEN EGGS**.



2. Once a leak is detected indoors, LEAVE the house as there is **risk of a fire**.



3. CLOSE the isolation valve to **STOP** the biogas flow.



4. VENTILATE the house so the gas can dissipate.



5. DETECT and REPAIR the leak.

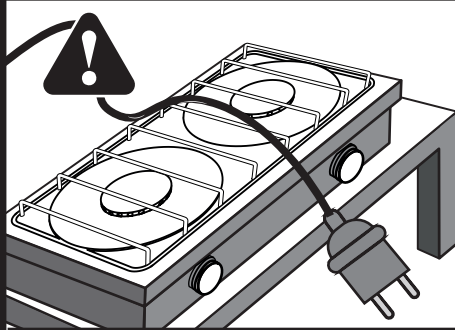


6. CALL for assistance.

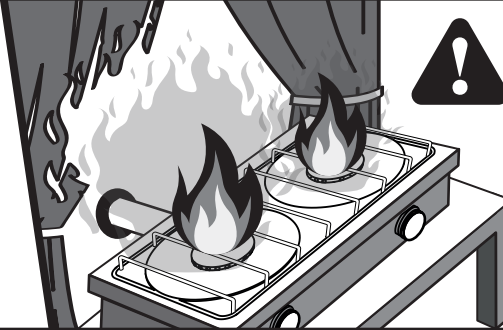




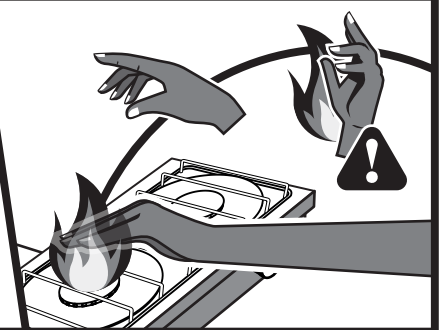
DO NOT let any wires or connections go over the stove. Place the BioStove on a solid and a steady surface.



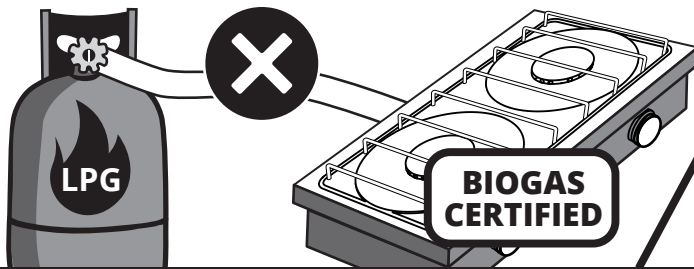
DO NOT place curtains or any other inflammable object near the flames.



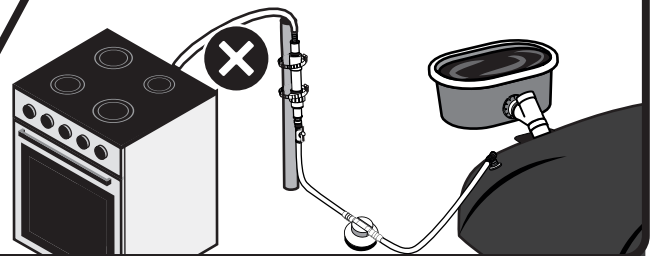
BE CAREFUL while using the BioStove. There is a burn risk.



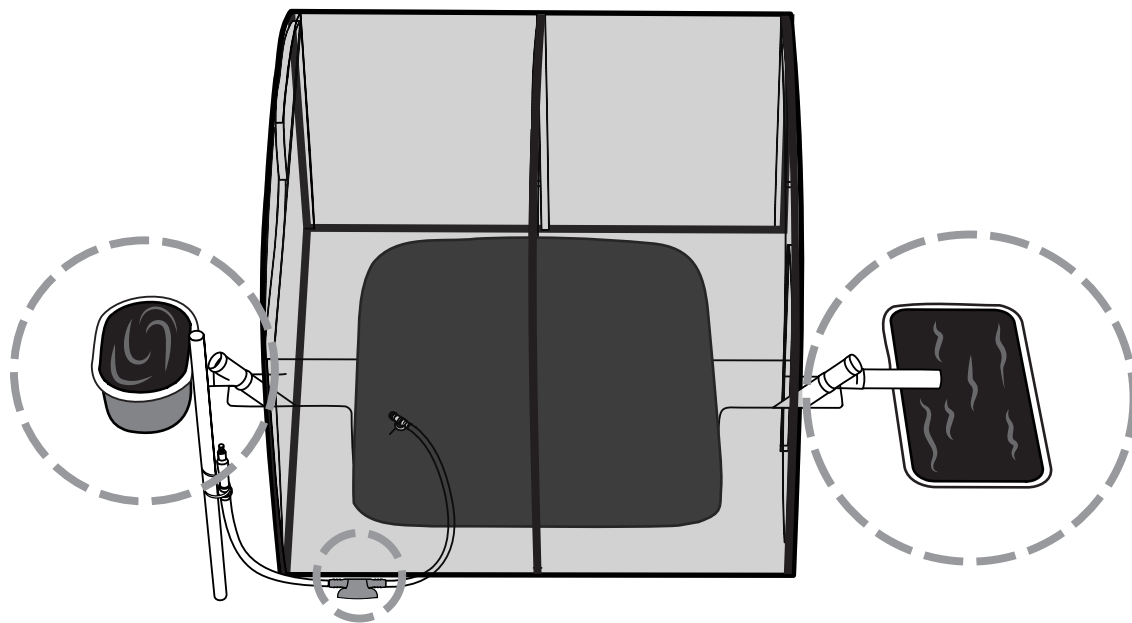
DO NOT connect the BioStove to any gas source other than the biodigester.



DO NOT connect the biogas line to a natural gas stove.



IF THE BIODIGESTER IS INSTALLED IN A GREENHOUSE, **pressure relief valve and biofertilizer tank** must be installed **outside** the greenhouse. The greenhouse must be fully ventilated before entering.

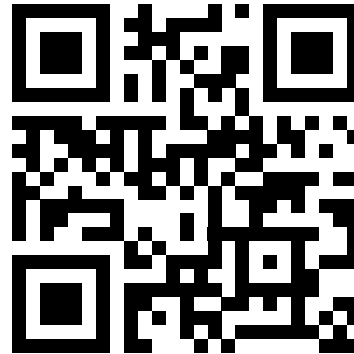




Biodigester startup



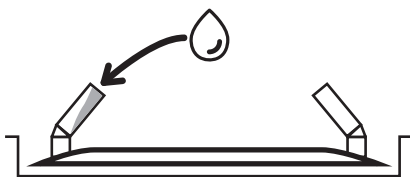
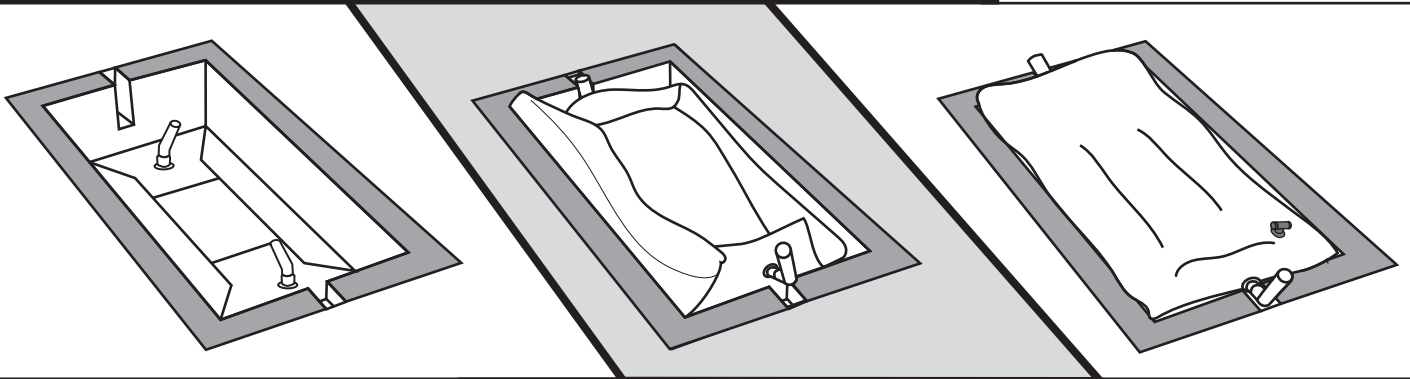
Use this **QR CODE** to watch detailed videos on how to get your digester ready to be used.



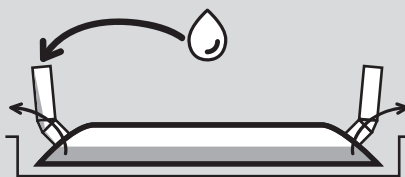
STEP 1 Fill the reactor with water until water reaches the inlet and outlet elbows.



15



Filling = 0%



Filling = IN PROGRESS



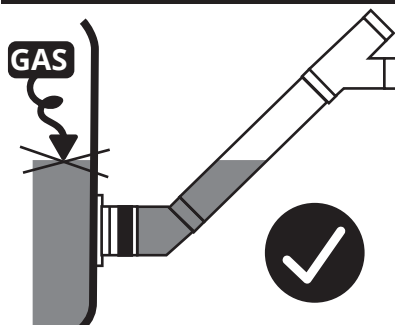
Filling = 100%



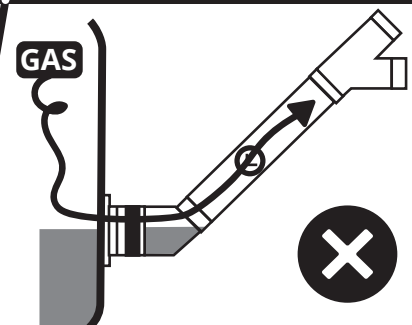
Water volume required to fill the biodigester

	m3	liters
Sistema 6	3	3,000
Sistema 8	4	4,000
Sistema 12	6	6,000
Sistema 16	8	8,000
Sistema 20	10	10,000
Sistema 30	15	15,000
Sistema 40	20	20,000

Good hydraulic seal: gas is trapped inside the reactor.

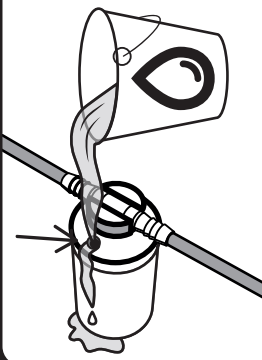


No hydraulic seal: gas can escape.

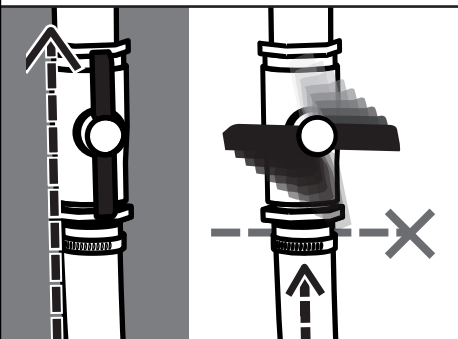




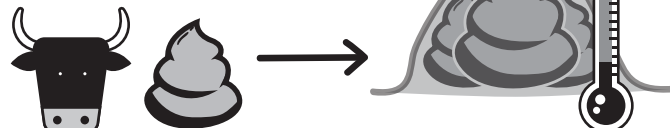
STEP 2
Fill the PRV with water.



STEP 3 Close the gas line.
(OM3), (OM3bis), (OM4)




STEP 4 First feeding.











We recommend using **cow manure** for the first feeding.

Storing manure piled under a tarp for 10/15 days before the first feeding will improve the startup of the digester.

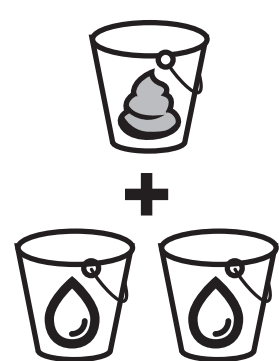
Add as much **biofertilizer** (also called **digestate** or **bioslurry**) as possible from a working digester to shorten the startup time.



STEP 4

	Cow manure First feeding - L or Kg 			Cow manure First feeding -  20L buckets		
	 Warm >23 °C	 Temperate 15 to 23 °C	 Cold 12 to 15 °C	 Warm >23 °C	 Temperate 15 to 23 °C	 Cold 12 to 15 °C
Sistema 6	450	350	250	23	18	13
Sistema 8	650	500	350	33	25	18
Sistema 12	900	650	450	45	33	23
Sistema 16	1300	1000	650	65	50	33
Sistema 20	1800	1350	900	90	68	45
Sistema 30	2600	2000	1350	130	100	68
Sistema 40	3500	2650	1800	175	133	90


ALWAYS DILUTE 1 part cow dung with 2 parts water



*NOTE: For any other type of waste, your technician will write the instructions on page 31 (at the end of the manual)

Example:

SISTEMA 6 Warm climate



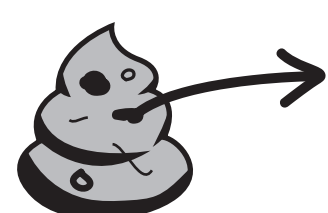
450L or Kg or 23 buckets

+



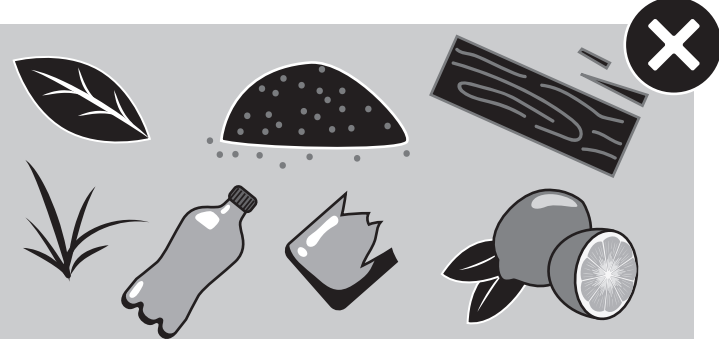
900L or Kg or 46 buckets

Before feeding, check and filter the manure



REMOVE

- Sand, stones
- Grass, fibers, leaves, wood, wood chips
- Soil
- Plastic, metal, glass
- Citric fruits
- Cooking oil, as it can cause operational issues



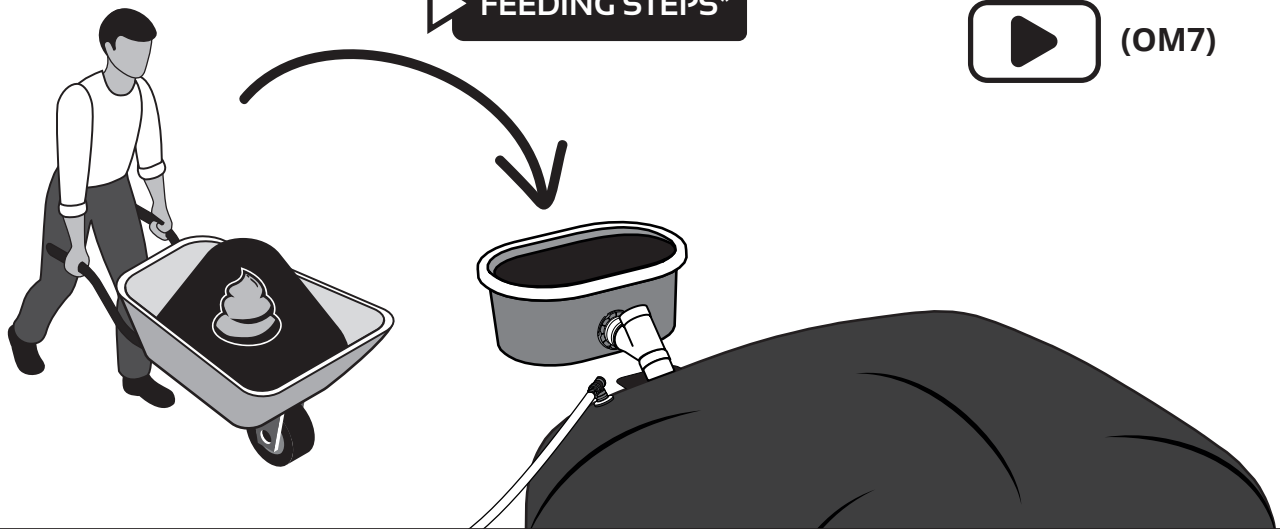


DO NOT FEED with manure from animals that were given antiviral or antibiotic medication **during the previous 5 days.**

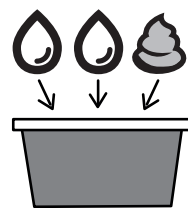


<5 days before feeding

▶ FEEDING STEPS*



- 1. Dilute** manure.
- 2. Mix** the manure and water.
- 3. Let** the mixture (**slurry**) rest for 5 minutes.
- 4. Remove** floating materials.
- 5. Feed** the reactor.
- 6. Remove** settling materials like stones and sand frequently.



1.



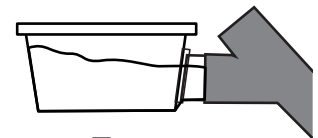
2.



3.



4.



5.



6.

*Applies for first feeding as well as daily feeding.



WAIT FOR THE
REACTOR TO
INFLATE

TIME TO INFLATE:*



Up to 3 weeks in warm climate/season

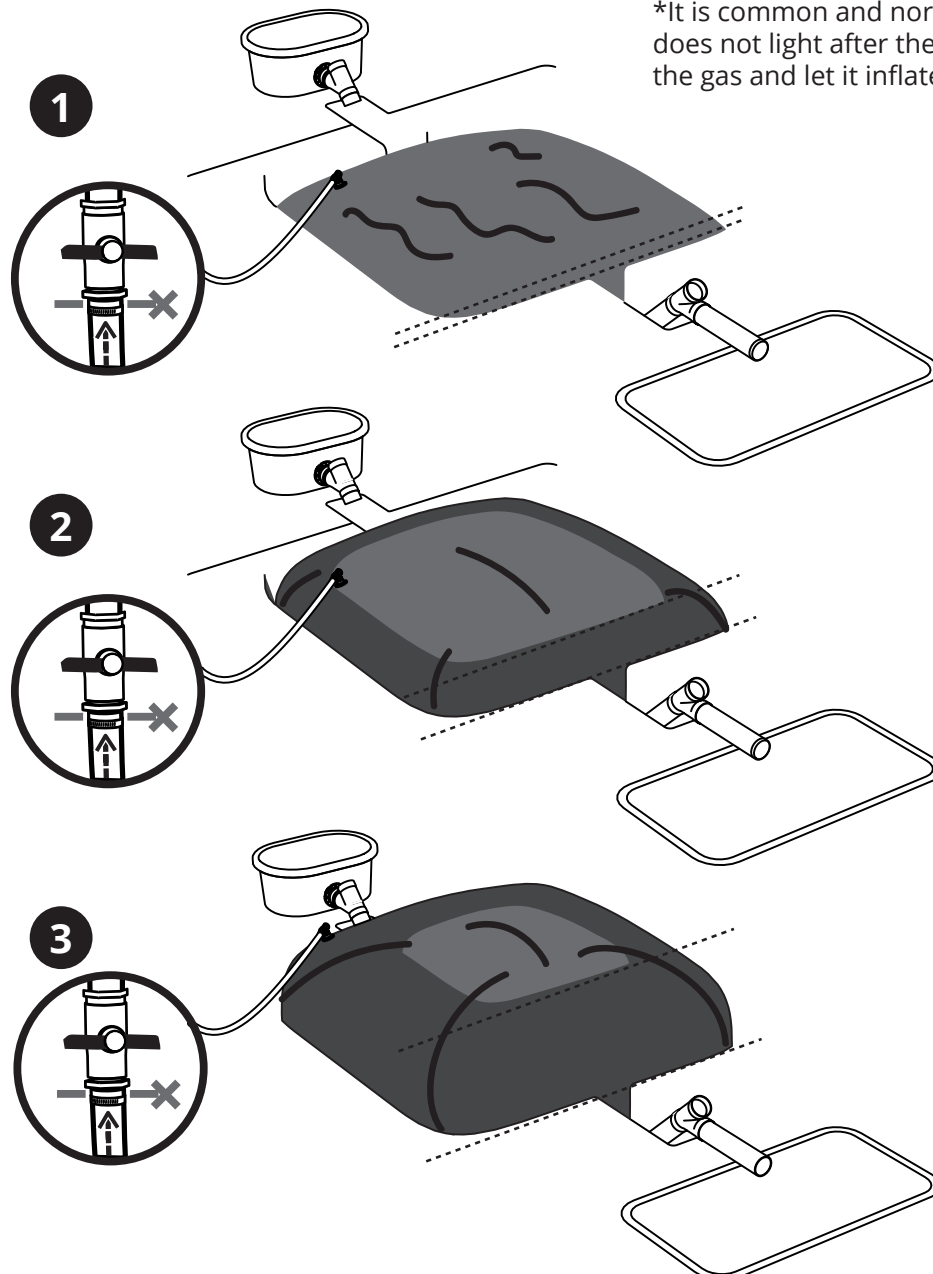


3 weeks to 1.5 months in temperate climate/season



1.5 to 2.5 months for cold climate/season

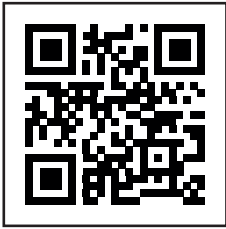
*It is common and normal that the biogas does not light after the first inflation: drain the gas and let it inflate once again.



NOTE: End of the user training for installation day.

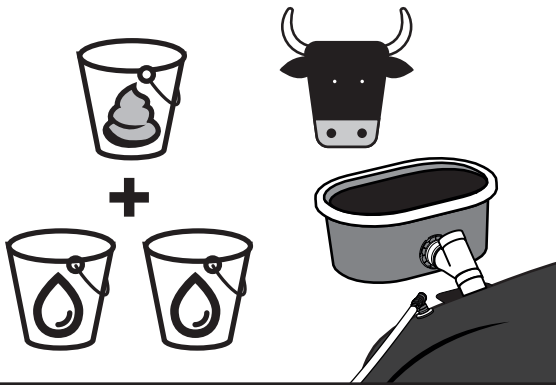


How to use your system



Maintain your digester

FEEDING. Feed your digester EVERY DAY with 1 volume of cow dung and 2 volumes of water.



Daily feeding*

*See **feeding steps** in page 11



CALENDAR			
1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	16
17	18	19	20
21	22	23	24
25	26	27	28
29	30	31	

AGITATION | Agitate once a week | DO NOT agitate



CALENDAR			
1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	16
17	18	19	20
21	22	23	24
25	26	27	28
29	30	31	



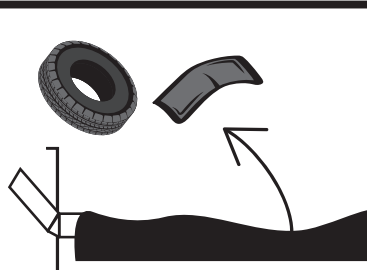
1

Remove any **sharp objects** from shoes to avoid damaging the reactor



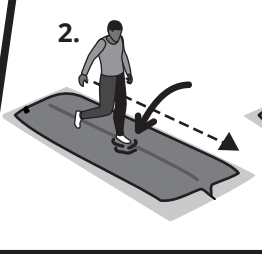
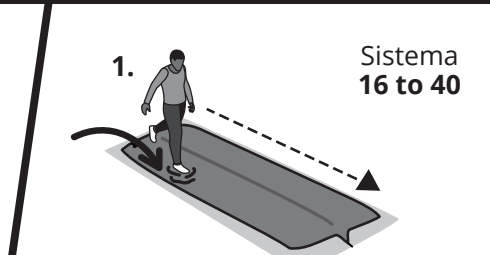
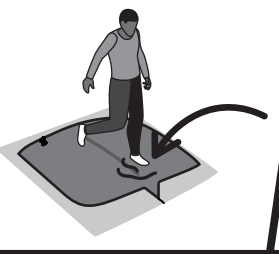
2

Remove **counterweights** before starting agitation



3

Agitate by walking slowly along your biodigester, shifting all your weight from one leg to the other.





MEMBRANE DAMAGE REPAIR

- 1. WASH** with soap and brush
- 2. RINSE** with clean water
- 3. Let it DRY**
- 4. APPLY** a small patch of butyl tape
- 5. APPLY** a larger one covering the first patch

LONG-TERM MAINTENANCE

CALENDAR
Every 5 to 7 YEARS or whenever it is required.

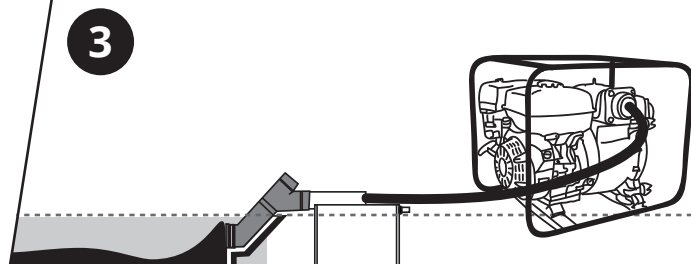
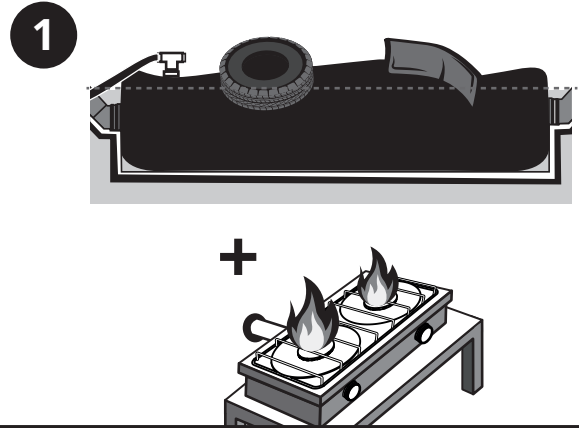
Flushing, emptying and restarting the system may be required if:

- There are **solids accumulated** inside.
- It hasn't been **agitated in a long time**.
- Not enough water has been added. The digester will be very **heavy in undiluted slurry/hard to agitate**.

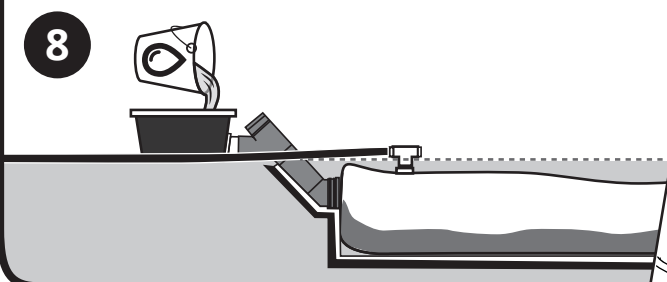
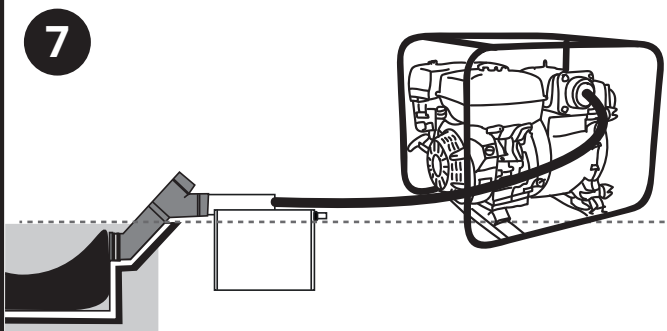
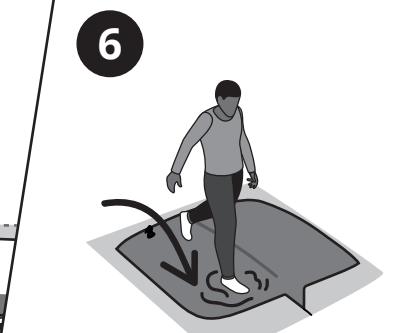
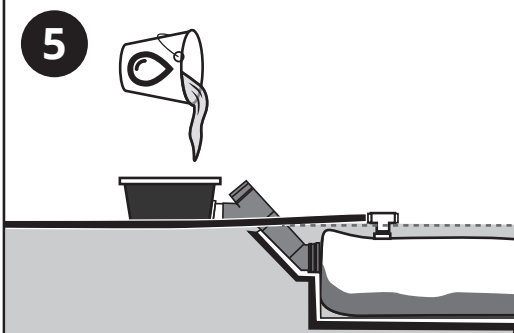


Process

1. **Deflate** the digester by using counterweights. Then, use all the burners of the BioStove to burn the remaining biogas.
2. **Agitate** the digester vigorously.
3. **Drain** the digester with a 3" slurry pump down to half the height of the trench.
4. **Agitate** vigorously.



5. **Refill** with water.
6. **Agitate** vigorously.
7. **Drain** the digester down to half the height of the trench.
8. **Refill** with water.
9. Proceed to **first feeding!**





Biodigester productivity

		Digester size 	SIS 6	SIS 8	SIS 12	SIS 16	SIS 20	SIS 30	SIS 40
 Warm Climate >23 °C	Daily feeding: cow manure 		45 L or Kg/day	65 L or Kg/day	90 L or Kg/day	130 L or Kg/day	180 L or Kg/day	260 L or Kg/day	350 L or Kg/day
	Daily biogas production		2 m3/day	2.4 m3/day	3.3 m3/day	4.8 m3/day	6.7 m3/day	9.6 m3/day	12.9 m3/day
	Daily cooking time on 1 burner 		3.4 Hr/day	4.8 Hr/day	6.6 Hr/day	9.6 Hr/day	13.4 Hr/day	19.2 Hr/day	25.8 Hr/day
	Weekly biofertilizer production		0.9 m3/week	1.4 m3/week	1.9 m3/week	2.7 m3/week	3.8 m3/week	5.5 m3/week	7.4 m3/week
 Temperate Climate 15 - 23 °C	Daily feeding: cow manure 		35 L or Kg/day	50 L or Kg/day	65 L or Kg/day	100 L or Kg/day	135 L or Kg/day	200 L or Kg/day	265 L or Kg/day
	Daily biogas production		1.3 m3/day	1.8 m3/day	2.3 m3/day	3.6 m3/day	4.9 m3/day	7.2 m3/day	9.6 m3/day
	Daily cooking time on 1 burner 		2.6 Hr/day	3.6 Hr/day	4.6 Hr/day	7.2 Hr/day	9.8 Hr/day	14.4 Hr/day	19.2 Hr/day
	Weekly biofertilizer production		0.7 m3/week	1.1 m3/week	1.4 m3/week	2.1 m3/week	2.8 m3/week	4.2 m3/week	5.6 m3/week
 Cold Climate 12 - 15 °C	Daily feeding: cow manure 		25 L or Kg/day	35 L or Kg/day	45 L or Kg/day	65 L or Kg/day	90 L or Kg/day	135 L or Kg/day	180 L or Kg/day
	Daily biogas production		0.8 m3/day	1.2 m3/day	1.5 m3/day	2.2 m3/day	3 m3/day	4.5 m3/day	6 m3/day
	Daily cooking time on 1 burner 		1.6 Hr/day	2.4 Hr/day	3 Hr/day	4.4 Hr/day	6 Hr/day	9 Hr/day	12 Hr/day
	Weekly biofertilizer production		0.5 m3/week	0.7 m3/week	0.9 m3/week	1.4 m3/week	1.9 m3/week	2.8 m3/week	3.8 m3/week

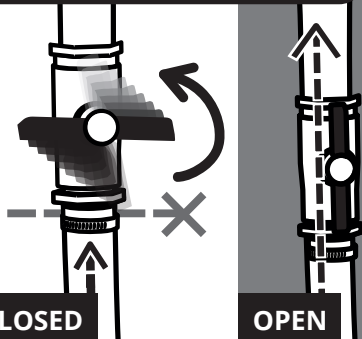


Use the energy you produce and maintain your biogas line!



(OM9), (OM11), (OM12),
(OM2), (OM3), (OM4)

FIRST BIOGAS FLAME



CLOSED

OPEN

1. OPEN the valve

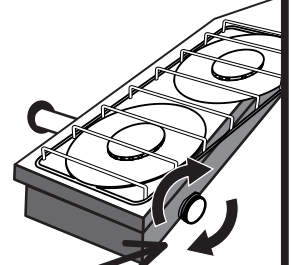
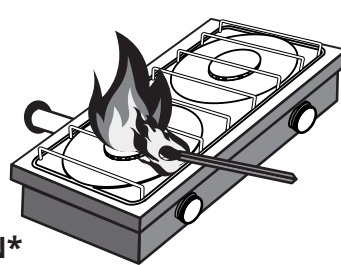
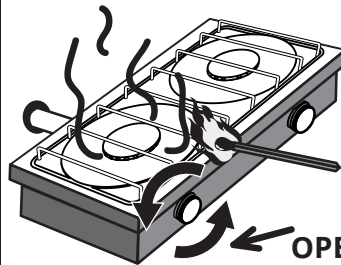
A



1 MINUTE**

B

C



OPEN*

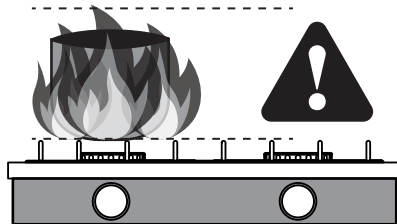
CLOSE

*When applicable, push and turn ON/OFF

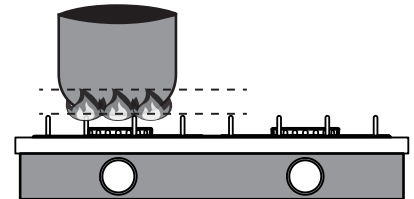
2. ROTATE the handle and let the biogas escape (A) while you try lighting it with a match. Once the flammable biogas reaches the burner, you will see the flame (B). **It might take up to one minute for the first flame. To CLOSE, rotate clockwise (C).



DO NOT
let the flame get too big.



DO
align the flame with the bottom section of the pan.



IMPROVE YOUR FLAME USING COUNTERWEIGHTS

Put a counterweight on top of the reactor.

ONLY use one of the following options:

- a. BioCounterweight
- b. Tires
- c. Sand bags



a.

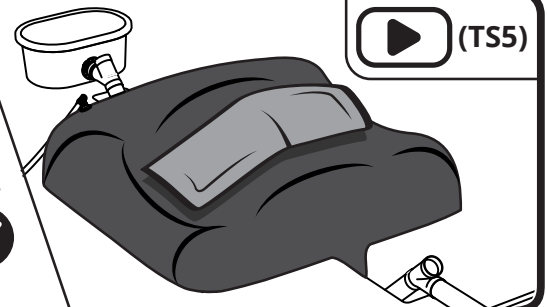


b.



c.

DO NOT use any sharp objects that could damage the reactor.



CLEANING THE BURNER

CALENDAR

Every week to every month depending on need.

Use

- brush
- water with lemon juice
- soapy water

Clean the cookstove burner to **unclog the burner holes.**



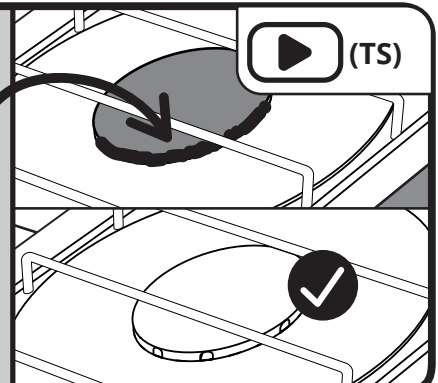
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+



+





PRESSURE RELIEF VALVE

CALENDAR

	1	2	3	4		
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

Fill the pressure relief valve with water 2 TIMES A WEEK

(OM2), (O&M1)

Filled PRV: Gas is stored in the reactor

Empty PRV: Gas can escape

WATER TRAP CHECK

CALENDAR

	1	2	3	4		
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

2 times a week

If water trap is full:
1. Close the biogas valve
2. Drain the water trap
3. Close the water trap
4. Open the biogas valve

(OM6)

WATER ACCUMULATION IN THE GAS LINE

CALENDAR

	1	2	3	4		
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

Every day

(TS1)

Check the clear pipe for accumulated water and drain it regularly by lifting it.
 Accumulated water will eventually block biogas flow.



FILTER REPLACEMENT



CALENDAR						
	1	2	3	4		
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

Every 2 weeks

Indicators that the **iron wool** in the filter needs to be **changed**:

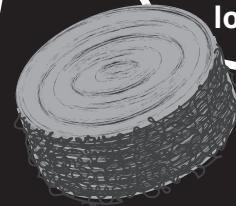
- **Low biogas flow** to the kitchen,
- **Unpleasant smell** in biogas,
- **Black water** coming out of the filter.

Upon **visual inspection** of the iron wool:

- Is it missing/consumed?
- Very dark and thick.

\$

IRON WOOL
can be
bought
locally

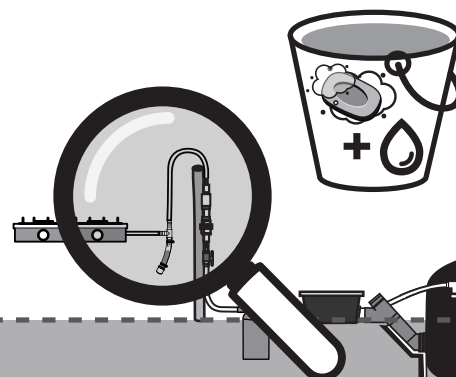


- 1** Close the biogas valve
- 2** Open the filter
- 3** Pull out the iron wool
- 4** Replace. Do not overfill the filter as it could block the gas
- 5** Make sure the **rubber gasket is clean** and well placed before closing the filter
- 6** Close the filter
- 7** Open the biogas valve

GAS LINE LEAK INSPECTION

CALENDAR

Once a year



Use **soapy water** on every **gas line connection** (filters, valves, pipes and fittings) while the **digester is inflated** to check for bubbles (leaks).

Make sure your **isolation valve is open!**



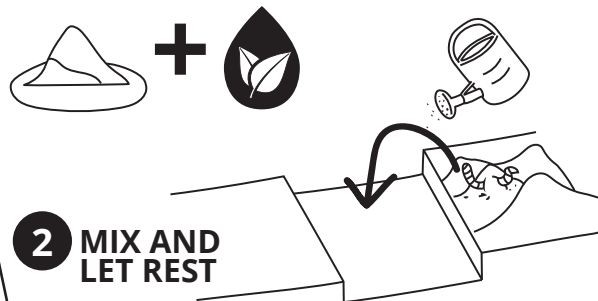
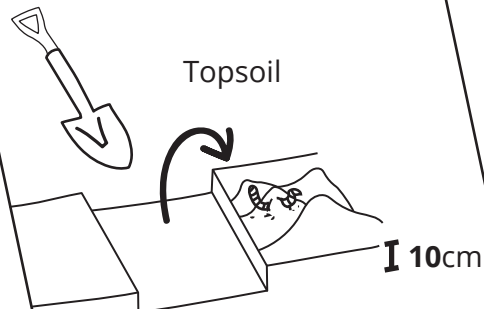
Soil preparation before planting:



Apply up to **20 liters of biofertilizer for every square meter** (or every step), mix the soil with the biofertilizer.

Let the soil rest for at least 2 days before planting (between steps 3 and 4).

1 REMOVE



2 MIX AND LET REST

1 biofertilizer:1 removed soil

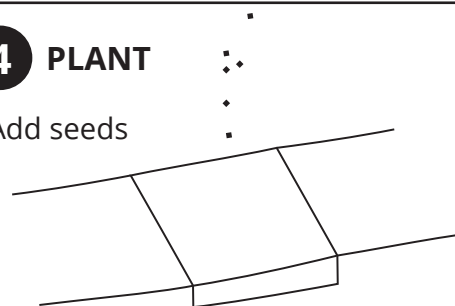
3 WATER

Add water



4 PLANT

Add seeds



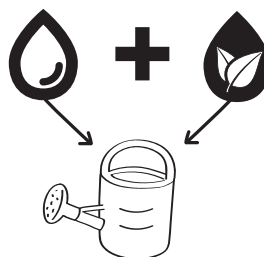
Crop and vegetable fertilization

During dry seasons, dilute 1 part of biofertilizer with 1 part of water. No need for dilution during rainy seasons.

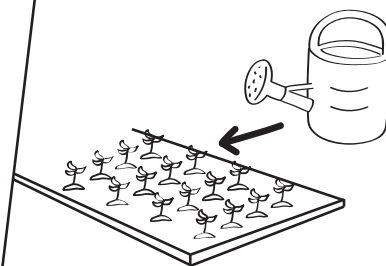
With dilution: Apply 2 to 10 liters of mixture for every square meter (or every step).

Without dilution: Apply 1 to 5 liters of biofertilizer for every square meter (or every step).

1 MIX Mix 1 water: 1 biofertilizer

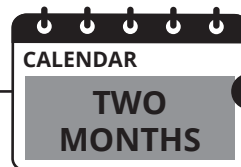
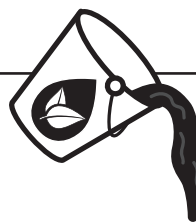
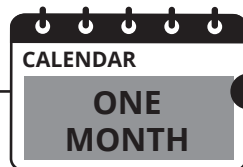


2 POUR Apply diluted biofertilizer



BIOFERTILIZER CONSISTENCY

Daily feeding STARTS



During the first 2 months, the biofertilizer:
- is very liquid and watery
- can be smelly
- can attract mosquitoes

The biofertilizer will get thicker with time



Maximize the biodigester's benefits

FEEDING REGULARITY

IRREGULAR FEEDING:

- Digester is starving
- Small flame

CALENDAR

1	2	3	4			
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

OVERFEEDING:

- Digester is too full of CO₂ and lacking CH₄
- NO flame

DO NOT feed MORE than recommended.

CORRECT FEEDING:

- Happy digester
- Beautiful flame

CALENDAR


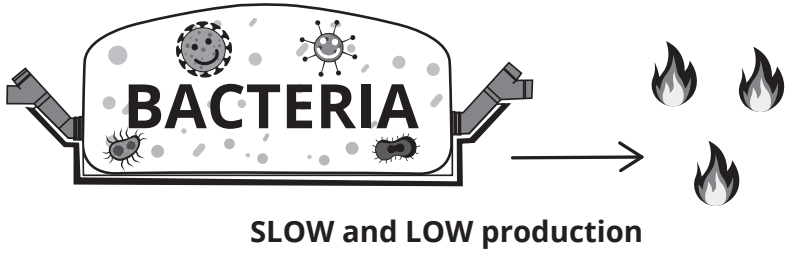

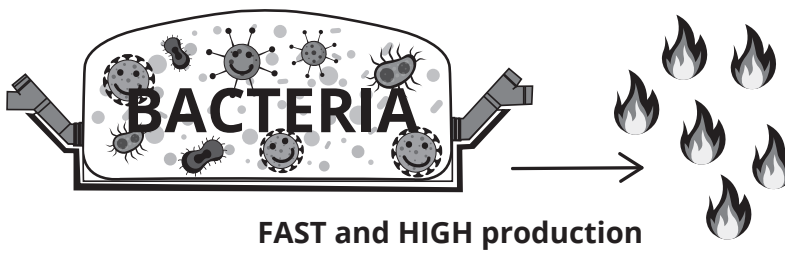
1	2	3	4			
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

DRY DUNG

1. ONE day before feeding: moisten 1 volume of dry dung in a bucket, then top up with water to create the consistency of wet cow dung.

2. During feeding, do normal water dilution (1 volume of cow dung with 1 volume of water).

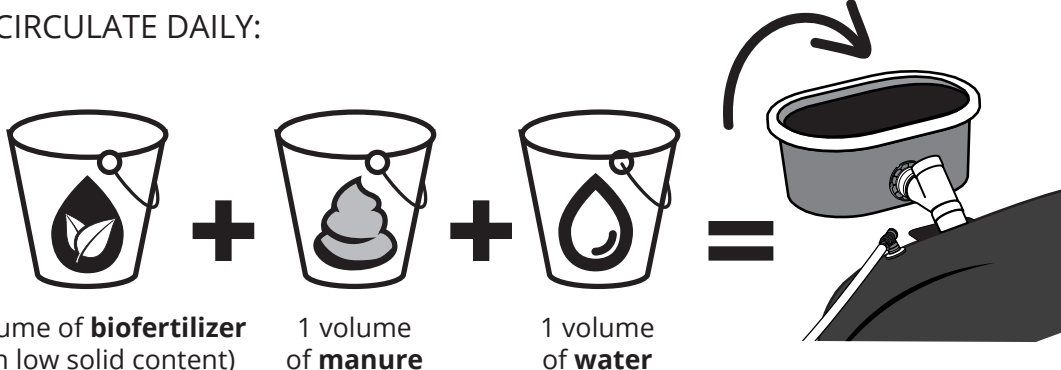


TEMPERATURE & BIODIGESTER PRODUCTIVITY		
<p>The COLDER the weather, biogas production will be slower and lower.</p>	 <15°	 SLOW and LOW production
<p>The WARMER, bacterias will produce more biogas faster.</p>	 >20°	 FAST and HIGH production

BIOFERTILIZER RECIRCULATION

RECIRCULATE DAILY:

This improves reactor performance in cold areas/ seasons and helps reduce water consumption.

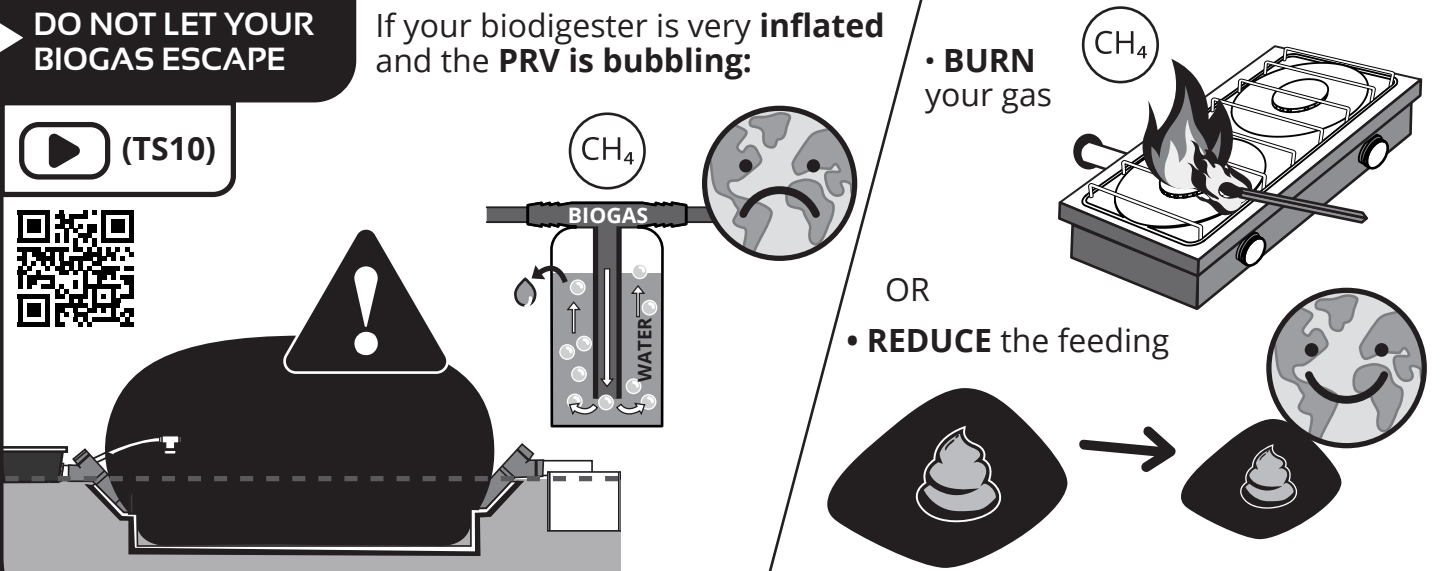


1 volume of **biofertilizer** (with low solid content) + 1 volume of **manure** + 1 volume of **water**

DO NOT LET YOUR BIOGAS ESCAPE

If your biodigester is very inflated and the PRV is bubbling:

- **BURN** your gas
- OR
- **REDUCE** the feeding



CH₄


WATER

CH₄

CH₄

CH₄

(TS10)

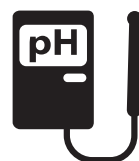




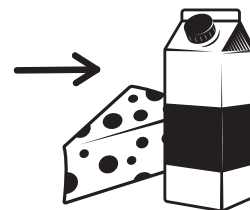
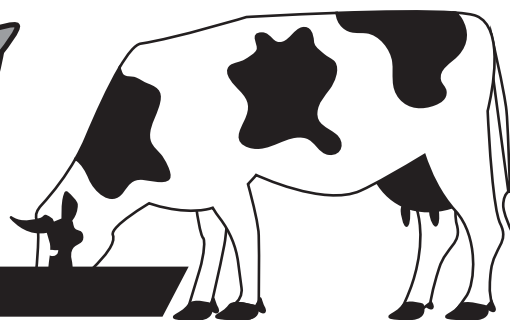
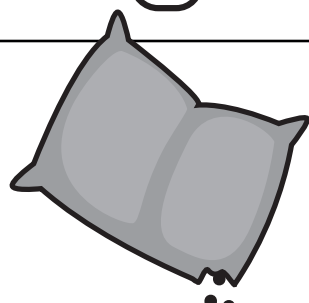
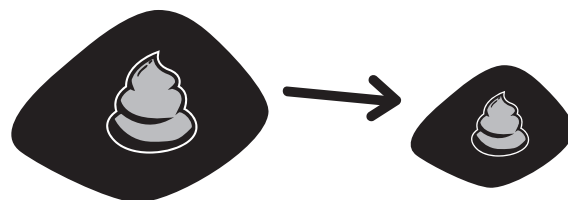
ANIMAL DIET

If your cows get rich food supplement, the **dung will be richer**, which will lead to **acidity in the digester**. Slightly reduce the feeding if such supplementing is happening!

HIGH



Reduce daily feeding



Spare parts

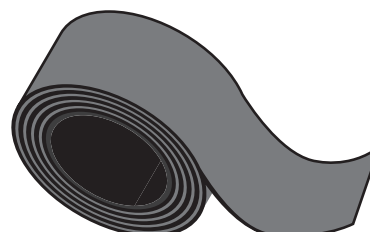
IRON WOOL replacement: every 2 weeks to once a month approx. To be purchased locally.



TRANSPARENT FLEXIBLE PIPE replacement: every 2 to 3 years approx. Contact Sistema.bio if you need replacement.



BUTYL TAPE for temporary membrane repair when external damage happens.





Biodigester specifications

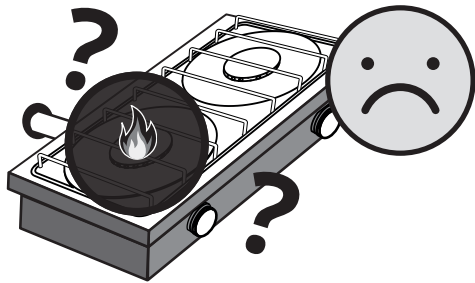
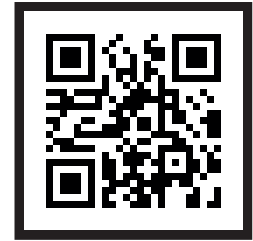
COMPONENT	MATERIAL	SPECIFICATIONS
Feeding tank	HDPE	Refer to corresponding digester model
Reactor	LLDPE	Refer to corresponding digester model
Biofertilizer tank	HDPE	Refer to corresponding digester model
Pressure relief valve	HDPE and UPVC	6" diameter, 20 mbar back pressure
Isolation ball valve	UPVC	1" diameter
Biogas filter	PVC	2" diameter
Transparent / flexible gas line	UPVC	1" diameter
Gas line	HDPE	1" diameter
Water trap	ABS and UPVC	1" diameter
Single burner (when applicable)	Cast aluminum	7 x 45 x 10 cm (h x l x w)
BioStove	Structure: stainless steel or coated mild steel Burner: Cast aluminum	Cookstove: 12 x 68.5 x 38 cm (h x l x w) BioStove 2: 19 x 58 x 36 cm (h x l x w)

Digester size	Approximate total kit weight	Feeding tank volume	Slurry volume in the digester	Gas storage in the digester	Biofertilizer tank volume	Area requirement length * width (excluding biofertilizer tank)
	kg	Liters	m3	m3	m3	m * m
Sistema 6	67	110 L	4	2	1	5 * 3.6
Sistema 8	93	110 L	5.5	3	2	6 * 3.6
Sistema 12	109	160 L	8	4	2	7 * 3.6
Sistema 16	137	160 L	11	6	4	9 * 3.6
Sistema 20	163	160 L	15	8	4	11 * 3.6
Sistema 30	219	160 L	22.5	12	8	15 * 3.6
Sistema 40	257	160 L	30	15	8	19 * 3.6



ISSUE:

- I do not have sufficient biogas to cook
- I do not have biogas in my BioStove, and my digester is flat!



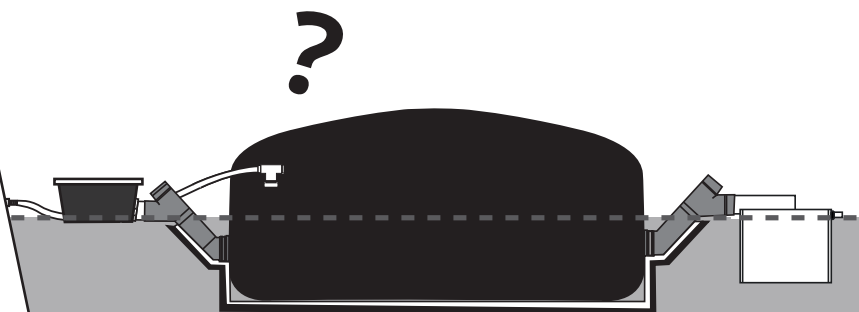
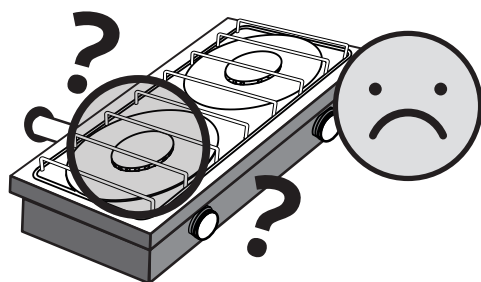
- **Is there enough water in the inlet and outlet pipes?** Make sure they are filled so that biogas cannot escape. Refer to section **"Biodigester startup"** "Fill the reactor with water until water reaches the inlet and outlet elbows." on page 9. Videos: I3, I5.
- **Have you completed your first feeding?** Refer to section **"Biodigester startup"**, "First feeding" on page 10. Video: OM7.
- **Has enough time passed since the first feeding?** Refer to section **"Biodigester startup"**, "WAIT FOR THE REACTOR TO INFLATE" on page 12.
- **Are you following the feeding instructions?** Refer to section **"How to use your system"**, "Maintain your digester" on page 13 and **"Maximize the biodigester's benefits"**, "FEEDING REGULARITY" on page 21. Videos: OM7, OM8.
- **Is your pressure relief valve filled with water?** Refer to section **"How to use your system"**, "PRESSURE RELIEF VALVE" on page 18. Videos: OM2, O&M1.
- **Were the BioStove valves, the water trap or the biogas filter left open?** Close them! Refer to section **"How to use your system"**, "FIRST BIOGAS FLAME" on page 17, "WATER TRAP CHECK" on page 18 and "FILTER REPLACEMENT" on page 19. Videos: OM6, TS12, OM5.
- **Is there a leak?** Refer to section **"How to use your system"**, "GAS LINE LEAK INSPECTION" on page 19.
- **Cold weather, rainy season?** You can recirculate your biofertilizer to improve biodigester productivity during cold seasons. Refer to section **"Maximize the biodigester's benefits"**, "TEMPERATURE & BIODIGESTER PRODUCTIVITY" on page 22.
- **Are the burner and the BioStove installed in different rooms?** Check if somebody else is using the biogas!

If your biogas production is still low: CONTACT YOUR CUSTOMER CARE!



ISSUE:

- I do not have biogas in my BioStove or it does not light, and my digester is inflated!



- **Have you placed a counterweight on your digester?** Refer to section **“How to use your system”**, **“IMPROVE YOUR FLAME USING COUNTERWEIGHTS”** on page 17. Video: TS5.
- **Were the gas valves left closed?** Open them! Refer to section **“How to use your system”** **“Use the energy you produce and maintain your biogas line!”** on page 17. Videos: OM3, OM3bis, OM4.
- **Are you regularly draining your water traps?** Refer to section **“How to use your system”**, **“WATER TRAP CHECK”** on page 18. Video: TS3.
- **Is your biogas line sagging?** In biogas line low points, water can accumulate and block the biogas from flowing! Elevate the gas line to direct the accumulated water towards the water trap or the PRV. Refer to section **“How to use your system”**, **“WATER ACCUMULATION IN THE GAS LINE”** on page 18. Videos: TS1, TS6.
- **Is the iron wool in the biogas filter blocking the biogas flow?**

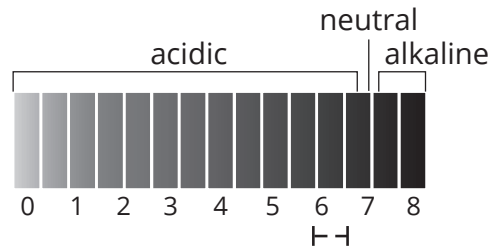
Open the filter and pull out the steel wool. Use a stick to make sure there is no old steel wool inside. Try to burn the gas on your BioStove! Refer to section **“How to use your system”**, **“FILTER REPLACEMENT”** on page 19. Video: OM5.
- **Is the gas line folded at any point?** Inspect your gas line and make sure there is no blocking point.
- **If only 1 of the 2 BioStove burners does not have a flame**, the burner valve might be blocked. Call your technician!
- **Are you overfeeding your digester?** Refer to section **“Maximize the biodigester’s benefits”**, **“FEEDING REGULARITY”** on page 21. Measure the pH of the biofertilizer from your outlet pipe using a calibrated pH meter (please follow pH meter calibration instructions). If the pH level of the biofertilizer is low and you continue to feed your digester, it could keep the bacteria from producing biogas: too much carbon dioxide and not enough methane.

If your biogas production is still low: CONTACT YOUR CUSTOMER CARE!



ISSUE:

- Slight acidification:
pH 6 to 6.5



1. Stop feeding the reactor & **empty** the digester of biogas through the pressure relief valve.

2. Agitate the digester thoroughly.
Video: OM13.

3. Let it rest for 3 days or until it inflates.

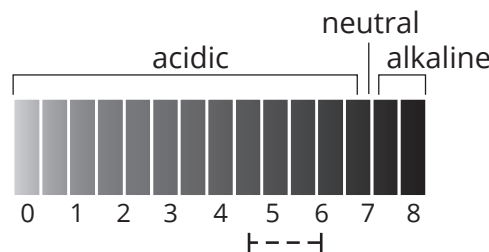
4. Try lighting the biogas stove.

5. If the gas does not burn, repeat from step 1.

If your biogas still does not light: CONTACT YOUR CUSTOMER CARE!

ISSUE:

- Strong acidification:
pH 4.5 to 6



1. Stop feeding the reactor & **drain** all the biogas.

2. Agitate the digester thoroughly.
Video: OM13.

3. Empty at least half of the digester.

4. Refill the digester with:
A) water mixed with as much biofertilizer from a working digester as possible
B) water mixed with 5-10kg of limestone powder for a Sistema 6 (increasing proportionally to the digester size).

5. Let it rest for 1-3 weeks or until it inflates.

6. Try lighting the BioStove.

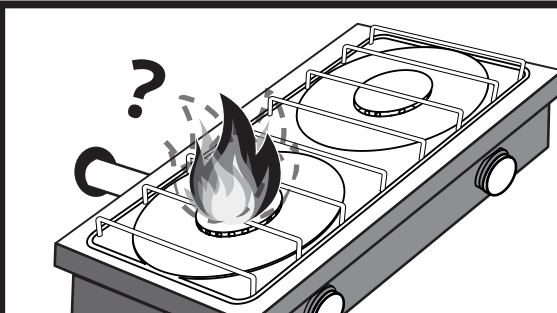
7. If the gas does not burn, empty the digester of biogas through the pressure relief valve and let it rest for 1-3 weeks or until it inflates and produces a flammable gas.

If your biogas still does not burn: CONTACT YOUR CUSTOMER CARE!



ISSUE:

- The flame in my BioStove is intermittent/dancing



There might be water accumulated somewhere in the gas line.

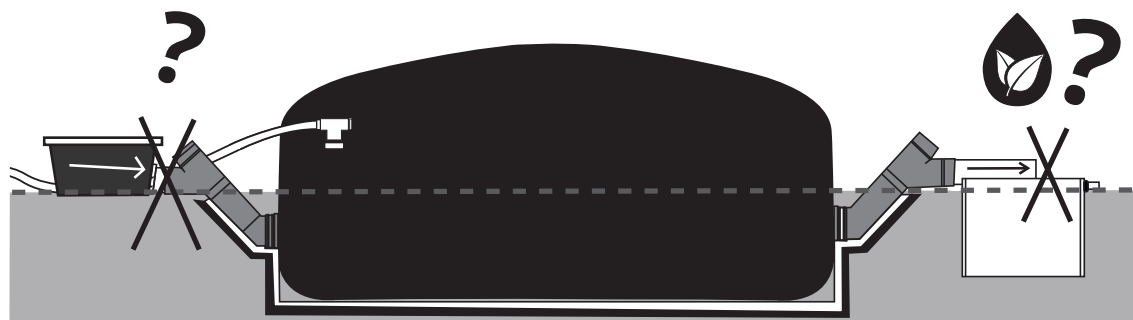
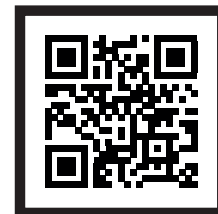
- **Is your biogas line sagging?** In biogas line low points, water can accumulate and block the biogas from flowing! Elevate the gas line to direct the accumulated water towards the water trap or to the PRV. Refer to section “**How to use your system**”, “**WATER ACCUMULATION IN THE GAS LINE**” on page 18. Videos: TS1, TS6.

- **Are you regularly draining your water traps?** Refer to section “**How to use your system**”, “**WATER TRAP CHECK**” on page 18. Videos: TS3, OM6.

If your flame is still dancing:
CONTACT YOUR CUSTOMER CARE!

ISSUE:

- The slurry is not entering the digester
- The biofertilizer does not come out of the digester



- **If your biofertilizer only comes out when the digester is inflated**, there is no problem!
- **Unclog your inlet or outlet pipes** from dry or solid material that may be blocking the flow. Use a thin, flexible stick (like bamboo) to unblock the pipe through the Y fitting. Video: TS11.

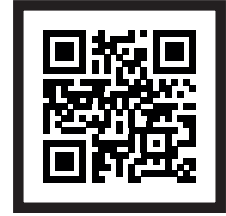
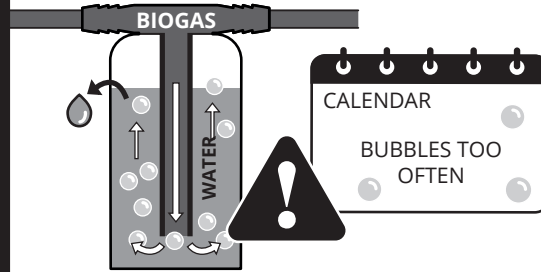
- **Is the the inlet pipe lower than the outlet pipe?** Elevate the feeding tank slightly by placing stones or soil under it.

If your slurry is still not flowing:
CONTACT YOUR CUSTOMER CARE!



ISSUE:

- My pressure relief valve bubbles too often!



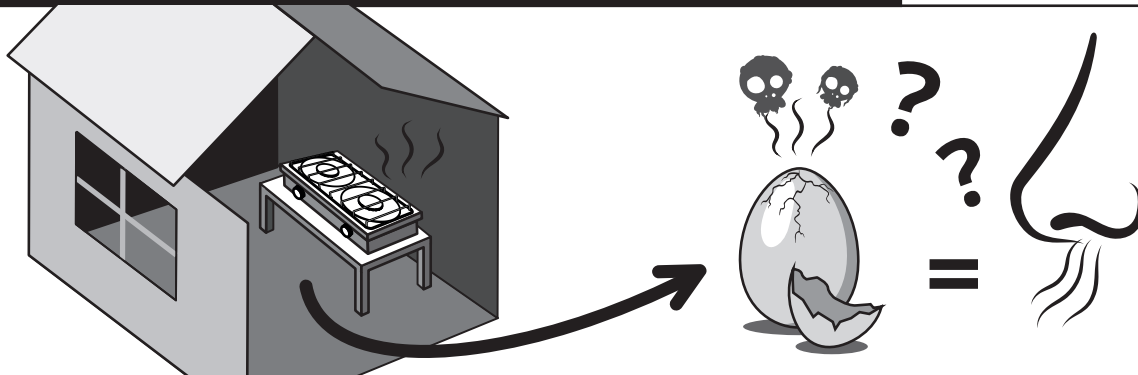
- **Are you filling your pressure relief valve regularly?** Refer to section “How to use your system”, “PRESSURE RELIEF VALVE” on page 18. Videos: OM2, O&M1.
- **You might be producing too much biogas!** Please burn your excess gas or use it to warm water in a pan! If it still bubbles regularly,

progressively reduce feeding. Refer to section “Maximize the biodigester’s benefits”, “DO NOT LET YOUR BIOGAS ESCAPE” on page 22. Video: TS10.

If your digester still produces too much biogas: CONTACT YOUR CUSTOMER CARE!

ISSUE:

- There is a gas/rotten eggs smell in the kitchen

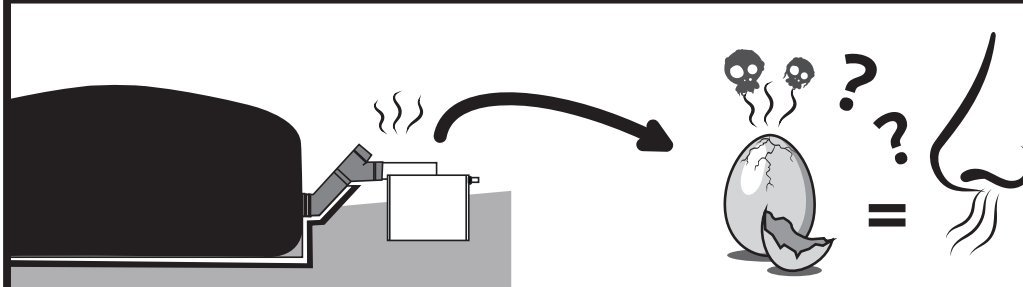


- **Does it smell while you light your cookstove?** Do not wait long before presenting the match to the burner to limit the release of unburned biogas. Refer to section “How to use your system”, “IMPROVE YOUR FLAME USING COUNTERWEIGHTS” on page 17. Videos: OM11, OM12.
- **Are you frequently changing the iron wool in your filter?** Refer to section “How to use your system”, “FILTER REPLACEMENT” on page 19. Video: OM5.
- **Were the cookstove valves, water trap or biogas filter left open or not properly closed?** Close them! Refer to section “How to use your system”, “FIRST BIOGAS FLAME” on page 17, “WATER TRAP CHECK” on page 18 and “FILTER REPLACEMENT” on page 19. Videos: OM6, TS12, OM5.
- **Is there a leak?** Refer to sections “How to use your system”, “GAS LINE LEAK INSPECTION” on page 19 and “Safety”, “Biogas” on page 7.

If you still detect a biogas smell in your kitchen: CONTACT YOUR CUSTOMER CARE!

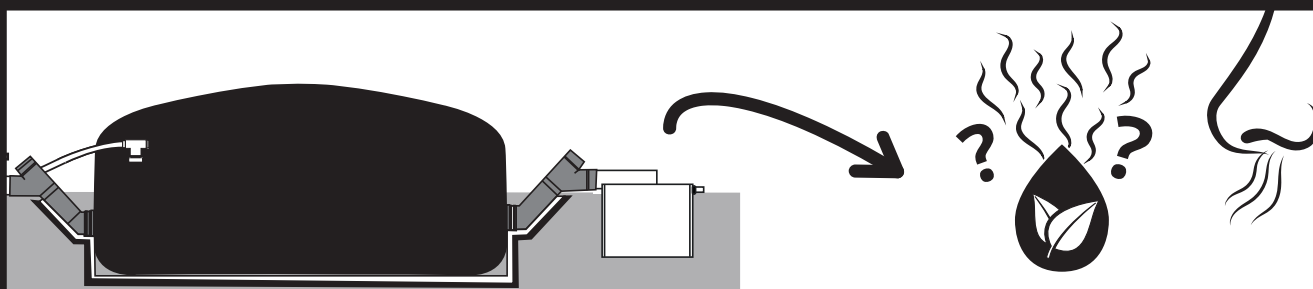


ISSUE: • There is a gas/rotten eggs smell near the digester



- **Can you see water in the inlet and outlet pipes?** Make sure they are filled so that biogas can't escape. Refer to section **"Biodigester startup"** "Fill the reactor with water until water reaches the inlet and outlet elbows." on page 9. Videos: I3, I5.
- **Is your pressure relief valve filled with water?** Refer to section **"How to use your system"**, "PRESSURE RELIEF VALVE" on page 18. Videos: O&M1, OM2.
- **Is there a leak?** Refer to section **"How to use your system"**, "GAS LINE LEAK INSPECTION" on page 19.
- **Is your biogas filter properly tightened and with the filter gasket?** Refer to section **"How to use your system"**, "FILTER REPLACEMENT" on page 19. Video: OM5.
- **Is the transparent pipe between the digester and the filter cracked?** Call your Customer Care!

ISSUE: • My biofertilizer stinks!



- **Are you overfeeding your digester?** Refer to section **"Maximize the biodigester's benefits"**, "FEEDING REGULARITY" on page 21. Measure the pH of the biofertilizer from your outlet pipe using a calibrated pH meter (please follow pH meter calibration instructions). If the pH level of the biofertilizer is low and you continue to feed your digester, it could keep the bacteria from producing biogas: too much carbon dioxide and not enough methane.
- **Are you feeding your digester with organic waste other than animal dung?** Some wastes are too rich to be properly digested and require specific control of the feeding quantities! Contact your Customer Care.



Disposal

- **The packaging** of your biodigester kit **is recyclable**. We recommend you to take it to the nearest **recycling center or equivalent**.
- **Used iron wool** can be **disposed of** in the bin or added to **compost to enrich it with iron and sulphur** -shred first!
- Once the **20 year lifetime** of your **digester is over** and it is no longer in use, **take its components** to a **local recycling center**.
- If you **need information on recycling centers**, feel free to call us.



Details to keep in mind

Technician's name:

Installation date:

Type of waste:

Daily feeding volume:

Dilution:

Serial number:



Your Well Being with Sistema.bio

At Sistema.bio, your safety and well-being are our top priority.

Your health, safety, and security are very important to us. If you ever feel unsafe, face a risk to your health, or notice something that could harm others - such as a safeguarding issue (any situation where someone's safety or well-being is at risk) - please let us know.

HOW TO REPORT A CONCERN

1. Call us at:

- **Customer Care, India**

Email: indiacustomer@staging.sistema.bio
Phone: +91 9607606660

- **Customer Care, Kenya**

Email: africacustomer@staging.sistema.bio
Phone: +254 711 082888

- **Customer Care, Uganda**

Email: africacustomer@staging.sistema.bio

- **Customer Care, Mexico**

Email: atencionalcliente@staging.sistema.bio
Phone: +52 1 55 9199 2411

- **Customer Care, Colombia**

Email: atencionalcliente@staging.sistema.bio

2. ANONYMOUS REPORTING

Submit an anonymous report through our online form:

<https://sistema.bio/anonymous-complaints-grievances/>

We're here to listen, act, and ensure everyone stays safe. Don't hesitate to reach out!



LOCAL SISTEMA.BIO CUSTOMER CARE:

Name:

Telephone:

Email adress:

<https://sistema.bio/contact-us/>

**If you have any issue, please contact
Sistema.bio Customer Care**

FOR MORE INFORMATION, VISIT:
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