

## Slurry Activator

“Converting a problematic waste product into a valuable organic fertilizer.”

Suitable for dairy, hog, poultry liquid manure, **penergetic g** acts as a catalyst to naturally create an aerobic condition in the slurry, activating beneficial microbes which transform the slurry into a nutrient rich organic fertilizer &ndash; which is far more beneficial than the more commonly occurring and problematic untreated (anaerobic) manure or slurry.

**Penergetic g** is an economical, easy to apply manure treatment method (requiring no capital equipment) used by thousands of dairy farms in Europe (and around the world).



## APPLICATIONS

Penergetic g is easy to apply:  
in the barn effluent channels / alleys  
through slatted floors into underground pits  
directly into a storage tank or lagoon

## RECOMMENDED DOSAGES

Application may be started at any time – when the storage tank/lagoon is all or partially full or after it is emptied.



Initial use: For every 100 cubic metres of slurry, mix 1.0 to 2.0 kg of penergetic g with plenty of water and pour into underground pit, slurry tank/lagoon or effluent channels.

[Note: 1.0 m<sup>3</sup> = 35.3 cu ft. = 265 US gal.]

Each subsequent application: Add 5 g per livestock unit (LSU)\*\* weekly or 1 kg for every 100 cubic metres of additional slurry or liquid manure generated into effluent channels / alley or underground pit.

\*\* Contact distributor for details on LSU equivalents, e.g.: a cow = 1 LSU; heifer = 0.7 LSU; sow = 0.4 LSU; pig 25-40 kg = 0.06 LSU, etc.

## PRODUCT FORMS (2 formats)

- Penergetic g for slurry and liquid manure (dairy and poultry)
- Penergetic g for pig slurry

## PRODUCT SIZE

10 kg boxes

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## COST STRUCTURE

Sample Costs: Dairy: Milk Cow: 2¢ a day per cow (\$7.30 / year); Heifer: 1.4¢ a day (Annualized)  
Hog: Sow: 1.2¢ a day per sow; pig (farrow to finish) 42¢ (total cost over 28 weeks).

## Cost Savings:

- no capital equipment (or capital expenditures) required
- no aeration equipment
- minimal agitation required (sometimes none)
- lower energy costs
- reduced need for barn ventilation equipment & cost
- no need for lagoon cover (for odour containment)
- less need for soil incorporation/injection

## BEST OF ALL!

By recirculating treated manure – a higher value, nutrient-rich organic fertilizer (superior to untreated manure) back to the land:

- need for (and cost of) other forms of nutrients (synthetic fertilizer) is reduced
- transportation and manure spreading expense reduced versus using less fertile untreated manure
- disease and insect suppression expenses should also be reduced

*≈ Using penergetic g permits manure management to be turned  
from a cost centre into a profitable venture. ≈*



## **MODE OF ACTION**

Penergetic g uses a proprietary process to infuse information from oxygen and minerals into the carrier medium (calcium carbonate). This information activates the aerobic microorganisms, stops the putrefaction process and stimulates the beneficial decomposition/rotting process. Since pig slurry sometimes responds more slowly to the application of penergetic g for slurry and liquid manure, special action properties (information) have been incorporated into penergetic g for pig slurry to accelerate the process.

## **HOW PENERGETIC G WORKS**

Penergetic g works so effectively because it activates an aerobic process in the slurry. How is this achieved and why it is advantageous are described below:

## **TRANSFORMING A PROBLEMATIC WASTE INTO A VALUABLE ORGANIC FERTILIZER**

### **Slurry as a “problem situation” requiring resolution**

The daily problems involving slurry are familiar to any dairy or pig farmer: blocked effluent channels, floating layers and solidified sedimentation layers in the slurry tanks, the need for extensive lagoon agitation before applying the slurry, an acrid, pungent smell in the area of barns and pits, gas emissions during agitation and application of the slurry, burning and scorching of the crops after application and many other problems. Often despite the farmer's best efforts, the slurry fails to produce the desired fertilizing effect. This leads to the application of additional fertilizers and other crop protection measures.

### **The underlying problem – putrefaction**

Typically, slurry will become a problematic waste product when conversion takes place by means of putrefaction processes. This involves decay under anaerobic conditions, i.e. in the absence of oxygen. Anaerobic conversion of slurry leads to the development of malodorous gases, including hydrogen sulphide and ammonia, and (odourless) methane gas. Also problematic, the odour carriers in manure – indole and skatole (3-methylindole) – attract harmful insects. These insects lay their eggs in the slurry, and the subsequent larvae often remain in the slurry when it is applied on the fields, leading to crop damage and the need to apply pesticides. Furthermore, the valuable substance ammonium nitrogen is lost in the anaerobic slurry, because ammonium is converted into ammonia, through volatilization, and consequently is no longer available as a nutrient for plants.

### **Oxygen through aeration?**

The conventional method of introducing oxygen into the slurry involves mechanical aeration by means of stirrers or compressors. However, this technical method becomes problematic when dealing with large quantities of slurry which cannot be stirred effectively every day. Floating layers then quickly form, further sealing off the slurry from the oxygen supply and thus strengthening the anaerobic environment. Also, the annual energy costs for stirring/agitation operations can be considerable.

### **The natural solution – decomposition**

But there is another way! The simple and natural solution to turn slurry into a valuable organic fertilizer involves activating decomposition processes in the slurry which only take place with oxygen. The decomposition processes involve mould fungi, yeasts and many other microorganisms and include several biological processes which are absolutely vital to maintaining a state of equilibrium in nature. Mould fungi very quickly bind any ammonia which is present in the first stage of the decomposition process to form ammonium nitrogen, which is subsequently available to plants as a slow release source of nitrogen. The harmful and unpleasant biogases are also largely eliminated, providing for a noticeable difference in the pit and during application. Healthy, decomposed (rotted) slurry thus constitutes an important element of a closed substance cycle management system which benefits the soil, plants, animals and humans alike.

### Activating sludge

The best solution is a simple method which activates the aerobic bacteria while avoiding the use of external energy and other factors detrimental to the environment. Penergetic g possesses the specific active properties of oxygen and reactivates the life processes in slurry. The putrefactive bacteria die and the oxygen which is present in the slurry is aerobically activated. An oxygen-producing and breathing biomass quickly arises. The micro algae which develop change the colour of the slurry to dark green and the work performed by the bacteria renders the slurry homogeneous. In the course of time, existing floating layers and sedimentation layers dissolve. As a natural side-effect of these processes, the smell is diminished. Using the decomposed slurry produced with penergetic g enables the quantity of commercial fertilizer used to be reduced.

#### RESULTS OBTAINED WITH PENERGETIC G

The aerobic process created in the slurry leads to homogenization.



The slurry pit prior to using penergetic g  
[heavy crust layer evident]



Adding penergetic g causes the  
floating layer and sedimentation layers  
to become dissolved.



The process leads to a completely  
homogenous free flowing composition.  
Also odour and insects are diminished.

# A NEW APPROACH TO THE TREATMENT OF LIQUID MANURE

## Treating liquid manure using penergetic g

After mixing the indicated quantity in water (at a rate of 1.0 kg per 100m<sup>3</sup> of manure to be treated) the mixture can be sprinkled using a watering can into the effluent channels or through the slats of the split-bottom floor of the livestock barn. The first thing that will become evident is that the noxious gases will disappear. Experience has shown that this is most change is evident quickest in the case of hog farming operations. For example, whereas prior to treatment levels of ammonia may have been 17 ppm, three days after applying penergetic g readings of 4 ppm will be more common.

A second effect: The manure becomes more fluid in the effluent channels and there are no longer blockages in the corners and at the effluent outlet to the storage pit. Also, after a few weeks, any crust that existed on the concrete walls in the livestock area becomes completely dissolved, meaning that the fluidity is decisively reduced by these deposits and subsequently the walls can be rinse simply with water and in the future crusty manure deposits will no longer occur at the walls.

Now let us follow the flow of the manure into the storage tank. Typically, most liquid manure storage tanks are characterized by a thick floating layer on the surface. Although it will take some time (sometimes several months), treatment with penergetic g will eventually result in this layer becoming totally dissolved. In most cases, this layer is reduced remarkably after four weeks. However, in the case of storage tanks located outside, as a result of the oxidation caused by the air a thin layer of 2-5 cm may always remain. Yet, experience has shown this to not have any negative consequences for the breakdown and eventual distribution of the slurry.

It has also been report that on some farms the crust layer was up to 1.0 metre thick. Nonetheless, after six months it was total dissolved and no residue layer remained. The process inside the storage tank is interesting and worth commenting on. The uppermost layer is normally thick and dry. In some cases these buoyant layers are thick enough to support a person stand on top of it. After applying penergetic g cracks and veins begin to appear and become filled with liquid. Next, the manure becomes more active as it begins to generate more or more bubbles and especially at the shell a scum forms. A definite reduction of the foul smell can also be observed.

## Treatment in the storage area

Manure pits and containers have to be treated in the following way: the quantity of penergetic g needed is put into a barrel, and afterwards the barrel is filled with liquid manure, the preparation is then stirred / mixed and then distributing into the liquid manure (with a bucket, watering can or other means). For those who have a stirring device in their slurry tank or lagoon, it is advantageous to stir the liquid occasionally during this process. Normally, one can observe a significantly increased generation of bubbles on the surface.

## Penergetic g benefits from contact with water

It seems to be of crucial importance that penergetic g is applied with plenty of water. If one takes a watering can the slat flooring in a livestock barns (such as the rearing stalls for pigs) should be watered carefully so that the microscopically small powder transfers its information quickly to a big quantity of water which then can get into much better contact with the microorganisms in the manure.

## The treatment of solid manure

With solid manure the procedure is similar, yet for maximum results a product with slightly different information (penergetic k) is used. The required quantity can be applied directly in the livestock barn – either onto the bedding or onto the flooring directly. The result is a faster decomposition process and a reduction in noxious gases in the barn. On the whole, these Penergetic products have a maximum effect without requiring a big effort.

## Creating a healthy circulation

The Penergetic approach encourages the recirculation of nutrients. Firstly, by reducing the harmful effects of animal effluents (and odours) right in the livestock barn and the slurry storage tank; and secondly because the penergetic powder dissolved in the manure, is transported to the fields where it can continue with its effect. A healthy circulation starts.

Penergetic users who have observed this circulation for the second or third year report that not only do the animals enjoy the green forage (or silage) that has been cut from fields treated with penergetic-manure, but also they experience increased milk production and their animals are in a better state of health. A further side benefit is that some farmers indicate that there are customers who can distinguish the aromatic milk of "penergetic-cows" from other milk - and request it.

Decomposition and putrefaction - the great adversaries	
Putrefaction (anaerobic) - untreated	Decomposition (aerobic) - treated
Leads to the formation of: Hydrogen sulphide, Hydrogen chloride, Hydrocarbon, Phosphorus hydride, Ammonia (NH <sub>4</sub> ) N losses!	The following substances are formed / made available: Plant-available trace elements, such as zinc, copper, magnesium, manganese, molybdenum and many others Nitric oxide (NO <sub>3</sub> ) N bound to form fungal protein (slowly flowing source of N)
Toxins (poisons), which promote diseases	Antibiotics, inhibitors to prevent diseases
Livestock exposed to risk of viruses	Destruction of viruses
Anaerobic bacteria do not produce any vitamins	Mould fungi produce vitamins and enzymes
Putrefaction leads to zinc deficiency; zinc deficiency leads to viral infections	Mould fungi break down large quantities of zinc (important in building up protein)
Putrefaction leads to pest infestation	Decomposition processes are essential for healthy plants. Humans are part of this "soil-plant-animal-man" chain!
Acrid, pungent putrescent odours	Low-odour to odourless
Formation of floating layers and sedimentation layers in slurry	Slurry remains liquid and homogeneous
Formation of strong root toxins	No substances to inhibit root growth
Danger of scorching during application	No scorching of plants during application
Promotes the growth of woody top grass = inferior fodder	Promotes the growth of ground-covering bottom grass = nourishing fodder
Relatively high quantities of fertilizer are required, mineral fertilizer also needs to be used	Small quantities of slurry per ha. due to high fertilizing capacity, no or reduced mineral fertilizer required
Pollutants in dissolved form = danger for the groundwater	Nutrients in bound form = no risk to the groundwater

This information has been taken from the English translation of Erhard Hennig's book "Geheimnisse der fruchtbaren Böden" [The Secrets of Fertile Soil], with the author's permission.

**Product:**  
Penergetic g



**User:**  
Ramseyer Brothers  
Palézieux, Switzerland

## User Application Report

**Adviser:**  
Walser  
Mr. Beerhalter

**Date:**  
February / November 2003

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### Details of operation:

Size of herd: approx. 210 milking cows  
approx. 150 cattle  
Size of slurry pit: 2000m<sup>3</sup> – newly installed in March 2002  
Size of operation: 142 hectares

### Problem:

When slurry started to settle in the middle of the slurry tank (December 2002), the Ramseyer Brothers decided to try and homogenize the slurry by using Penergetic g.

The product was introduced to them by Walser, a company who manufacture and distribute fish oil and who are agents for Penergetic products for use in agriculture.

The product was used for the first time, with the co-operation of Mr. Juerg Beerhalter, in February 2003.



400g of Penergetic g was mixed with lukewarm water in a bucket and distributed over the slatted floor. Then, holes were made in the surface crust using a wooden slat, in order to transport the solution under the surface.

In total, approx. 8kg of Penergetic g was used on the first application. At the same time, a new mobile agitator was installed to ensure even distribution.

The same amounts were applied at the end of February and the beginning of March 2003.

By March, it was already noticeable that the massive surface crusts had by and large dissolved and that they could be mixed using the agitator. From the beginning of April, it was once again possible to mix all of the slurry without any problem.



Before Penergetic g was introduced, the agitator was used daily at automatic intervals of 2 to 3 hours for 15 minutes each time.

Once Penergetic g was introduced, the time needed to agitate the slurry was able to be cut down to once a week!

Power costs are now at one tenth of the costs needed before the introduction of Penergetic g. In other words, a saving of several thousand Francs per annum in this case!

In summer 2003, the surface crust reappeared to an extent, due to the extremely high temperatures and low rainfall recorded. However this still bore no comparison to the previously recorded levels of this problem. In late autumn, the Ramseyer Brothers will also introduce Penergetic t to their operation.



Signed:

Gérald & Eric Ramseyer  
Palézieux  
November 03

