EQUINE SOUNDNESS

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BENEFICIAL MICROORGANISMS FOR THE HORSE BARN

Please keep reading, it's easier than you think!

I discovered beneficial or effective microorganisms in 2003. And while it took me another year to wrap my head around the entire concept, I think today they are about the most helpful addition to our daily horse routine.

What are beneficial microorganisms? Effective and Beneficial Microorganisms (EM) are a mixed culture of fermentative, soil-based, beneficial microorganisms which can be applied to many environments to break down organic matter.

EM Technology

The concept behind beneficial and effective microorganisms ("EM") technology, was developed by Professor Teruo Higa*, at the University of Ryukyus, Okinawa, Japan. Dr. Higa is also the author of An Earth Saving Revolution I and II.

The fundamental principle of this technology, was the introduction of a group of beneficial and effective microorganisms to improve soil conditions, suppress putrefying (disease inducing) microbes and improve the efficacy of organic matter utilization by crops. Lactic acid bacteria, a major component of EM, will supress pathogenic microbes both directly and indirectly, through the production of antinomycetes. (Also known as EM's antioxidation effect, which improves the immune system of plants and animals.)

The beneficial microorganisms in Efficient Microbes (EM)™ have been used in a wide variety of fields for centuries.

In agriculture, these microorganisms have been used to enrich the soil and produce quality, healthy crops at a greater yield with decreases in pests, diseases, the need for weeding and tilling and agricultural chemicals.

In animal husbandry, they have been used with noticeable decreases in foul odors, the appearance of sickness and insect infestations, with noticeable increases in fertility from artificial insemination, and increases in the quality of meat, dairy and eggs.

In the environment, they have been used to cleanup polluted waters in ponds, lakes, reservoirs and seashores, including the cleanup of oil spills, the recycling of water from sewage facilities into uses for general cleaning, and the recycling of organic waste into quality fertilizer. There are countless other ways various industries worldwide are using beneficial microorganisms to better humankind, and we have only scratched the surface.

A. Photosynthetic Bacteria

The photosynthetic or phototropic bacteria are a group of independent, self supporting microbes. These bacteria synthesize useful substances from secretions of roots, organic matter and/or harmful gases (e.g.. hydrogen sulfide), by using sunlight and the heat of soil as sources of energy. Useful substances developed by these microbes include amino acids, nucleic acids, bioactive substances and sugars, all of which promote plant growth and development. The metabolites developed by these microorganisms are absorbed directly into plants and act as substrates for increasing beneficial populations.

B. Lactic acid bacteria

Lactic acid bacteria produce lactic acid from sugars and other carbohydrates, developed by photosynthetic bacteria and yeast. Therefore, some foods and drinks such as yogurt and pickles have been made with lactic acid bacteria for decades. However, lactic acid is a strong sterilizing compound, and suppresses harmful microorganisms and enhances decomposition of organic matter. Moreover, lactic acid bacteria promote the decomposition of material such as lignin and cellulose and ferments these materials, thereby removing undesirable effects of undecomposed organic matter.

C. Yeast

Yeasts synthesize antimicrobial and other useful substances required for plant growth from amino acids and sugars secreted by photosynthetic bacteria, organic matter and plant roots. The bioactive substances such as hormones and enzymes produced by yeasts promote active cell and root division. These secretions are also useful substrates for effective microbes such as lactic acid bacteria and actinomycetes.

Natural Boarding and Rehabilitation Facilities

Freedom Farm Inc.
Mary and Jerry Schmidt
493 Spring Road
Port Angeles WA 98362
360-457-4897
http://www.freedomfarms.net

Corona Vista Equine Center
Drs. Robert and Barbara Bowker
4107 Berry Road
Pleasant Lake MI 49272
517-575-5026
http://www.coronavistaequinecenter.com

Horrell Hill Equine Wellness Center
Claudia and Charles Garner
300 Saddlemount Drive
Hopkins SC 29061
803-400-3413
http://www.hoofcareunltd.com

All these facilities offer expert rehabilitation and boarding for your equine friend.

Activating EM (AEM)

The primary reason to activate EM is economy, not efficacy. It is perfectly acceptable to use EM without activating it. However, adding a sugar source and culturing the microorganisms ensures that the microbes are active. Once the following procedure has been followed, the end result will be a full strength culture of EM that can then be diluted and applied.

Materials:

airtight plastic container or large tank *
1 part EM *
1 part blackstrap molasses *
22 parts water
pH paper *

To save you doing the math:
3/4 cup EM
3/4 cup molasses
in 1 gallon of water.

* see "Resources" at end of article for purchase

Procedure:

Dissolve molasses in warm water
Add EM
(Activating EM is a mostly anaerobic process, thus the presence of excessive oxygen is not desirable. Keep the extension as warm as possible. If you keep the EM between 85-95 degrees it should activate in approximately 4 days. If the extension is kept between 70-80 degrees then allow for 5-7 days. Depending on technique and extension conditions, it may take anywhere from 4-14 days.)
Check the pH to ascertain when the process is complete;
(EM is ready when the pH drops to 3.7 or below. Do not use EM that has not dropped below 4.0. If your pH continues to drop to 3.0 or even 2.0 this is normal and indicates high microbial activity. The end product should smell slightly sweet and pickled.)
Activated EM, unlike EM, is best used within 7 days. It may last up to 1 month but should be used within this time. Do not extend an EM extension - the results cannot be guaranteed.

Dilution Guide

	EM (or AEM)	TO	WATER
1:50	1 tsp		1 Cup
	4 tsp		1 Quart
	5 Tbsp		1 Gallon
1:100	1 tsp		2 Cups
	2 tsp		1 Quart
	2.5 Tbsp		1 Gallon
1:500	3/4 tsp		2 Quarts
	1.5 tsp		1 Gallon
	2 Tbsp		4 Gallons
1:1000	3/4 tsp		1 Gallon
	1 tsp		6 Quarts
	1.5 Tbsp		2 Gallons
1:10,000	3/4 tsp		10 Gallons
	1 Tbsp		40 Gallons

Soil Uses - Gardening and Landscaping

EM can be used to inoculate plants, water and soil in various ways to achieve beneficial results. It can be sprayed on soil as a pre-planting treatment, used to inoculate seeds or transplants, and applied to growing crops as a foliar spray or through irrigation systems. EM is useful in growing nursery crops, container-grown plants, and even in hydroponics. After crops are harvested, EM is used to help break down crop residues. EM can be applied to cover crops and green manures during growth and upon incorporation into the soil, and is applied to pastures with good results.

To reduce ammonia in fish tanks, and promote beneficial bacteria in the water, add 1 part EM to 1000 parts water once a week, or as necessary. Use EM-X ceramics in the filter. S-type are porous to absorb ammonia and floating material and must be changed every six months. K-type are used to structure the water and need not be changed.

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Courses at Equine Soundness

For more information, please visit http://www.equinesoundness.com

1.) Professional Student

This course may no longer be taken in individual modules. Students may start any time and will receive individual mentoring through the practical days (Mentor Days 1-10). Upon enrollment we will customize your schedule to your individual needs. Once the schedule is set, you will have to meet all the given deadlines.

2.) Horse Owner Student

Students may start any time and will receive individual mentoring through the practical days (Mentor Days 1 and 2). Upon enrollment we will customize your schedule to your individual needs. Once the schedule is set, you will have to meet all the given deadlines.

3.) Online Student

Students may start any time.
Students taking only Module #1 and #2 have 6 month to complete their studies.
Students taking Modules #1 through #5 will have 12 month to complete the course.

4.) Veterinarian

May start any time. You will have 12 month to complete the course.

5.) Horsemanship Day
Horsemanship is an important part of your relationship with horses. We have set up a day to share our thoughts about safe and effective horse handling with special attention to trimming. This day will be held either in conjunction with mentoring days or together with the final practicum.

Thoughtful notes and planning—one of the hallmarks of trimmers at Equine Soundness Inc.

Finally! Livestock and Farm animals:

To improve the micro flora in the intestines and make nutrient absorption more efficient, mix EM into animal's drinking water at a ratio of 1:1000 to 1:5000.

Spray EM dilution in barns and pens to control flies and odors at a ratio of 1:100.

Foul odors are present in barns and livestock pens due to the proliferation of harmful, putrefactive microorganisms. These bacteria produce harmful toxins such as ammonia, hydrogen sulfide and methane. EM controls the proliferation of harmful microorganisms by competitive exclusion and the animal's quarters will be drastically improved.

From a cattle farmer: Our whole operation revolves around protecting the EM so we are chemical free and operate as organic. We just don't have a vet bill any more. If our cows or calves need attention we try EM first. It is great for scours, usually the next day they are over it.

I also agree with the holistic approach, get your ground healthy and you will have healthier animals and in turn we will have healthier food. We grow all natural beef and we guarantee that the beef you buy from us will never have

been given antibiotics. So we base a business on the fact that we won't have to medicate our animals.

My kids show our cattle so we spray EM-5 on the cows as a fly deterrent, I don't worry when they brush and groom their show cattle that they are being exposed to pesticides.

For Horses:
In the Hayfield:

We have done AEM on oat hay. We spray our windrows of hay before we bale it. We use a 4-wheeler sprayer with a 15 gallon tank and a spray bar attached. We turn the nozzles out and drive down between the rows as we spray. We use a mixture of about 1/2 and 1/2 AEM and water. We spray right in front of the baler. I haven't tested any but it sure helps keep down the spoilage, no mold.

Our best results for spraying fields have been to spray AEM in the fall. We did this on a field and broke the ground with a chisel plow and sprayed on top, then drug it in. The next year we had increased our hay by 5 times on that little 10 acre field. We mixed up our spray solution the night before and added extra molasses and let it sit over night. Always rinse your sprayer out with clean water when done.

Our horse had West Nile Virus, we put 20 oz (a soda bottle) on his feed everyday. A month later my son rode him on a 2 day trail ride (20 miles). He was the celebrity horse, the one who survived West Nile, everyone said it usually took months for them to get back to normal if they survive.

So much for testimonies from other users of EM.

Here is our own experience: The main diet of our horses consists of hay. We feed hay in a slow feeding system (hay nets and grazers) so the horses have to pull the hay out little by little and produce plenty of saliva for adequate digestion. The slowed down feeding is more natural for horses. We spray our hay with AEM. In the long run we have observed that our horses have become calmer and their coats look fabulous all year.

We spray our pastures with AEM. We use a 60 gallon water drum and add 3 cups of AEM to the water.

We add between 1/4 and 1/2 cup of AEM daily to the horse's feed.

We irrigate deep wounds with AEM and they heal without proud flesh. If we use Bentonite clay for wound treatment, we make the powder into a paste by adding AEM.

We spray the shelter floors and especially the urine spots with AEM. It controls the fly population and reduces odors. We add a spray every couple of days to the manure spreader.

While it may be a best to detoxify your horse, AEM can be very helpful for midline dermatitis if spayed on directly.

Water / Pond Treatment:

To treat sewer lines, livestock holding facilities, solid waste and food waste, apply at a ratio of 1:100 parts water and saturate then compost For septic systems, holding tanks, recreational vehicles and portable restrooms, apply 1 liter of EM per 1,000 gallon holding capacity every 3 months by pouring down a drain in the house, or directly into the holding tank. The septic system still may need regular pumping and maintenance.

To control algae blooms dilute activated EM at a ratio of 1:10,000 and spray over the pond or fountain once every 2-4 weeks beginning in the early spring. Or apply as needed. If it is not possible to spray the solution, introduce EM at several different sources in order to avoid shock to other pond life. Results will vary depending on the source of inflow and other factors.

Storage and Handling

Store EM out of direct sunlight at room temperature. When activating EM, some sunlight is preferable since the bacteria need light to reproduce. Do not refrigerate. Use by the recommended expiration date. If in doubt, check the smell and pH. Good quality EM will have a sweet-and-sour smell and a pH below 3.7. If the pH rises to 3.8, use the remaining EM as soon as possible or within 30 days. Do not use EM if a foul or rotten odor is present. Keep in mind that you are dealing with living organisms. Best results are realized when EM is supported with good soil management. Avoid bare soil. Feed beneficial and effective microorganisms with crop residues, cover crops, compost and other forms of organic matter.

Resources:

To learn more about EM: http://www.scdprobiotics.com/

To **purchase EM** (You are looking to purchase Pro Bio Balance, formerly known as SCD EM Original):

Western USA: http://www.mightymicrobes.com/

Eastern USA: http://www.midlandprobiotics.com/

Germany: http://www.scdprobiotics.de/

For International retailers and distributers please go to: http://www.scdprobiotics.com/category_s/47.htm

For **pH paper**: http://www.mightymicrobes.com/shop/product.php?productid=16209&cat=0&page=1

Here's a terrific **container** to brew AEM: http://www.eckraus.com/WINEMAKING/Wine_Making_Equipment/Fermentation_Vessels/Screw-Lid_Tanks_-and-_Pails/9_GAL_TUFF/Page_1/TT090.html

Molasses—Blackstrap (the best and cheapest I found): http://www.goldenbarrel.com/blackstrap-baking-molasses.php

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info@equinesoundness.com

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Did you know?

Students at Equine Soundness Inc. have the privilege of getting free help with their personal trim cases and participate in weekly online computer meetings as part of their comprehensive education. They also have their own Yahoo group site to exchange experiences and ask for help from fellow students and instructors. Please inquire about references or visit our website for student testimonies.