How to Form a Healthy Farm Organism: The Biodynamic Perspective on Economics

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Definitions

***Biodynamic farm*:**
Individualized organism in interaction with the ecological, social, economic and spiritual whole of which it is a part

***Biodynamics*: "Life force" (Rudolf Steiner, 1861-1925)**
From Grk. *Bios*=life+*dynamis*=force or power

*Oekonomia (*Aristotle, 384-322 B.C.)
Stewardship of the farm household based on "natural" principles
From Grk. *Oikos*=household+*nemein*=to take care of

Krematistike (Aristotle)
"Unnatural" management based on exchange of coins
From Grk. *Kremata=coins, money*

The Small-Scale, Integrated, Self-Sufficient and Sustainable Farm Organism:

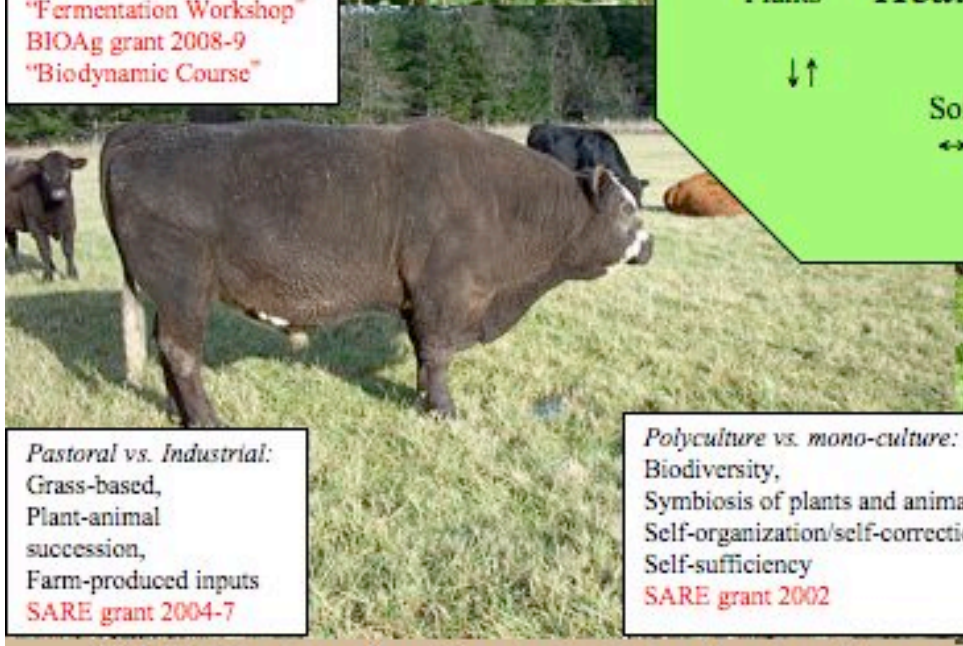
Local vs. imported fertility:
Composts,
Cover crops,
BD Soil Sprays
SARE grant 2004-7

Solar vs. fossil energy:
Photosynthesis,
Photo-voltaic irrigation,
Hydronic heating
EQUIP grant 2005
"Solar Irrigation"

Self-Sufficiency:
Food, Feed, and
Nutrient cycling
SARE grant 2002
"Small-Scale Grain"

Local Community:
Educational Programs,
Farm-to-School, CSA
SARE grant 2003-4
"Farm-to-School"
BIOAg grant 2008
"Fermentation Workshop"
BIOAg grant 2008-9
"Biodynamic Course"

Biological vs. mechanical processes:
Maximum soil organic life,
Place-specific immunities,
Disease prevention rather than suppression,
Run-off pollution control through biological cycling
SARE grant 2004-7
"Bio-Dynamic Forage Production"



Pastoral vs. Industrial:
Grass-based,
Plant-animal succession,
Farm-produced inputs
SARE grant 2004-7

Polyculture vs. mono-culture:
Biodiversity,
Symbiosis of plants and animals,
Self-organization/self-correction/
Self-sufficiency
SARE grant 2002

Perennial vs. annual species:
Native plants/wildlife,
Naturalized forages,
Farm-produced replacements
SARE grant 2004-7

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Programs

Synergistic programs:

Self-sufficiency
Pastoral production
Local fertility
Solar energy
Biological processes
Perennial species
Biodiversity
Local community

Public support: SARE, EQIP, BIOAg grants

Grant assumptions:
Improve profitability of farm and community

Profit and Economic Viability

Conventional definition:

Profit =excess of income over expenditures

Profit = Economic viability (*krematistike*)

Economic viability: Biodynamic view

Economic viability = solvency, no debt
Economic viability = resource renewability
Economic viability = self-sufficiency, -organization, -correction, -capitalization
Economic viability = farm organism health
Economic viability = "Natural" stewardship (*oekonomeia)*

Farm self-sufficiency

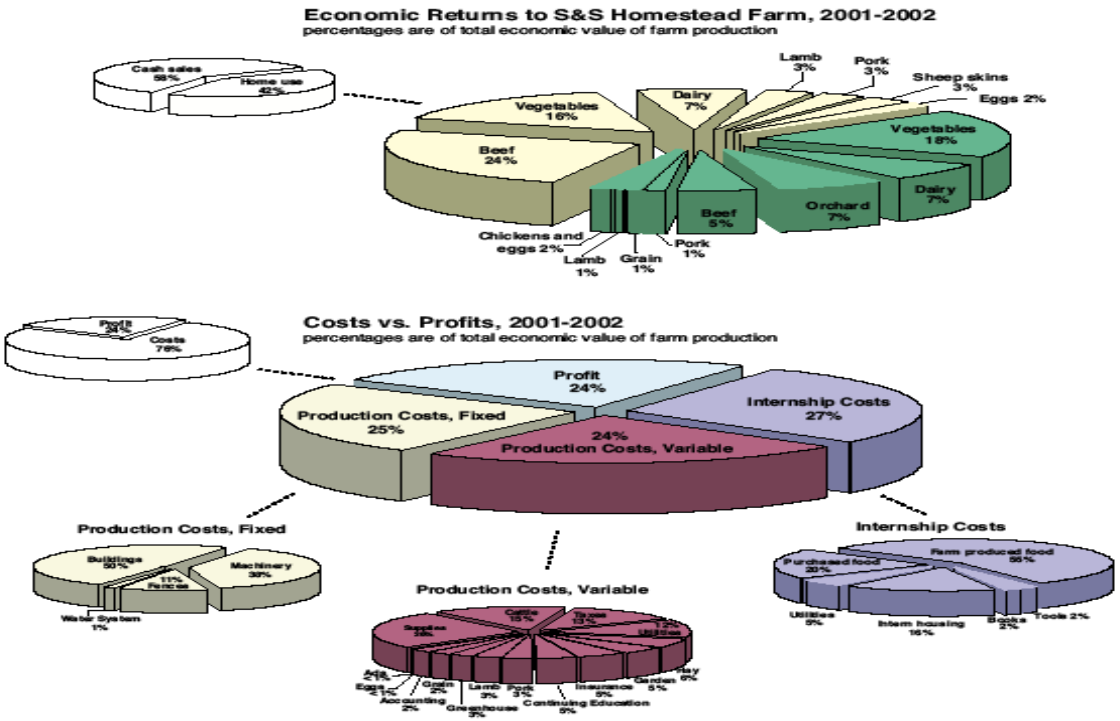
Feed yourself (family, trainees, employees), sell surplus

Feed animals and soil from farm-produced inputs

Produce and cycle needed resources (water, energy) on farm

Economic production

Economic Data for S&S Homestead Farm and
S&S Center for Sustainable Agriculture (a non-profit corporation)



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Farm self-sufficiency

Feed yourself (family, trainees, employees), sell surplus

Feed animals and soil from farm-produced inputs

Produce and cycle needed resources (water, energy) on farm

Self-organization and -correction

Natural systems are inherently balanced

Agricultural systems achieve balance through farmer's actions based on "natural" principles

Healthy farm organism = synergistic balance of its parts

Healthy farm organism corrects itself as the farmer responds to the task of balancing

Lessons learned:

Complex, diverse systems are healthier, more productive and disease resistant than non-diverse systems

Benefits of symbiosis are enhanced by farm produced fertility inputs (composts, cover crops, biodynamic preparations)

Cycling nutrients increases the *life force*

Biological processes strengthen soil health

Perennial species (farm-produced seed, animal replacements, perennial grains, native and naturalized plants, wildlife) strengthen soil and general farm health

Solar energy on the farm

Plant physiology: sunlight produces chemical compounds in plant tissues (photosynthesis)

Animal physiology: sunlight produces vitamin D in the skin

Electrophysics: sunlight generates electromotive force to drive irrigation, heat in hydronic systems

Agronomy: solar heat flows determine rainfall, wind and gaseous mineral flow patterns shaping crop production and soil health

Subtle energies in Biodynamics:

Energies behind photosynthesis and photoelectricity are gross phenomena in comparison to subtle formative forces shaping plants and animals

Matter is the visible form of spirit, spirit the invisible form of matter

Spirit is the life force causing the seed to sprout and lift itself into the air in vegetable, flower, tree form

Spirit is the formative force manifested in plant and animal morphology

Life force in plants and animals is released into the human body by digestion

Biodynamic energetics

Biodynamic farming is pastoral, i.e. grass-based, to maximize harvesting solar energy

Solar energies flow directly, *and* are reflected by planets and stars

Planets and stars radiate energies received when they exploded out of the proto-sun (solar nebular theory)

Solar energy flows reach the earth according to dynamic seasonal and diurnal rhythms

Solar nebular theory

1755, Immanual Kant proposed theory that the solar system concretized from gyrating nebula

1785, Marquis Laplace gave theory mathematical form

20th century physicists confirmed the theory as the most cogent explanation of the solar system's origin

Cosmic mineral flows

Modern astrophysics holds that essential mineral elements stream continuously from the cosmos to replenish the earth:

"…Stars blow up in titanic blasts that seed the galaxy with heavy elements, such as iron, calcium, and silicon. These elements come only from stars; the universe has no other way to create them. They drift into clouds of gas and dust which collapse into a generation of stars, planets and – in our case – life."

N. Tyson, et alia, *The Universe: At Home in the Cosmos,* 2000, Joseph Henry Press, an imprint of the National Academy of Science.

"Life force" as universal idea

- **Old Testament: "Breath of God" turns clay into living beings**
- **New Testament: "Creative *logos"* (Grk. word, form, thought) by which all things are made**
- **China: "*Ch'i"* (natural energy of the universe)**
- **Vedic India: *"Prana"* (Sanskrit "breath," life-sustaining force)**
- ***Melanesia:* "Mana" (impersonal force in humans, animals, nature)**
- **Germanic tribal culture: *"Hamingja"* (personal force identified with chief)**
- **European folklore: "Powers" (life principle(s) often imagined as separate nature beings)**
- **Native America/ Africa: "Great spirit" (source of life and creation)**
- **Emerson (Transcendentalism): "*Oversoul*" infusing all life**
- **Goethe: "*Earth spirit" (life force)***

Phenomenological science (1)

Aristotle (384-322 B.C.), Natural philosopher, mathematician: *Physics, On the Soul, History of Animals, Parts of Animals, Metaphysics*

Concepts:

Science (*dianoia: dia+noein*=revolving in the mind*)*

Energy (*energeia: en+ergon*=in+work)

Change (*kinesis: kinein+aesthesis=to move+perception)*

Potentiality (dynamis*=power*)

Entelechy *(en+telos=echein*=in+purpose+becoming)

Motion = fulfillment of potential purpose

Methods: observation of phenomena, induction, deduction

Quote: "The fulfillment of what exists potentially…is motion"

***(Physics,* 201, lines 10-11)**

Mechanistic science

Rene Descartes (1596-1650) Philosopher, mathematician, scientist. *Meditations on First Philosophy, Principles of Philosophy, Discourse on Methods*

Concepts:

***Cogito, ergo sum* (I think, therefore I am)**

Separation of mind, spirit, God from physical world

External world = mechanism governed by natural laws

Motion = physical action

Universe a mechanical system describable in mathematical terms (reduction)

Methods: Intuition, deduction, empirical studies

Quote: "*But motion…is nothing more than the action by which any body passes from one place to another*"

***(Principles of Philosophy,* II, 24)**

Phenomenological Science (2)

Johann Wolfgang von Goethe (1749-1832) Poet, natural philosopher and scientist: *Theory of Color, Metamorphosis of Plants, Comparative Anatomy and Zoology*

Concepts:

Ontogenesis irreducible to reductionist explanation

Life processes understood teleologically, rather than causally

Teleology of organisms illuminated by *form or type*

Holistic science is qualitative, requires human observer

Goethe (methods)

Sustained observation of natural phenomena through senses

Experimental variation (perspective)

Macro-level vs. micro-level (molecular) construction

Avoidance of mathematical abstraction (reduction)

Gradual intuition of unifying concept (*form* or *type*)

***Understanding* of living organisms through artistic representation**

Goethe (quotes)

"Wer will was Lebendigs erkennen und beschreiben,
Sucht erst den Geist herauszutreiben,
Dann hat er die Teile in der Hand,
Fehlt, leider! Nur das geistige Band.

(To know some living thing and describe it,
He hastens to expel its spirit;
Now he holds the parts in his hand,
But, alas! He lacks the spirit band)

***Faust*, Act I, Scene 4**
(The devil mocking the scientist)

Goethe (quotes)

"There is a delicate empiricism which intimately identifies itself with the object of study and thus becomes the actual theory"

***Aphorisms,* no. 165**