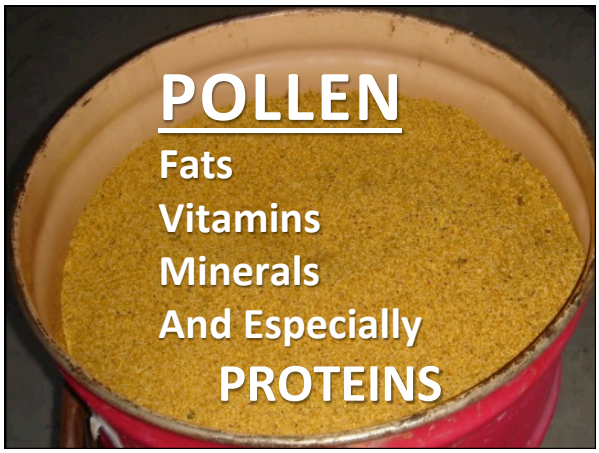
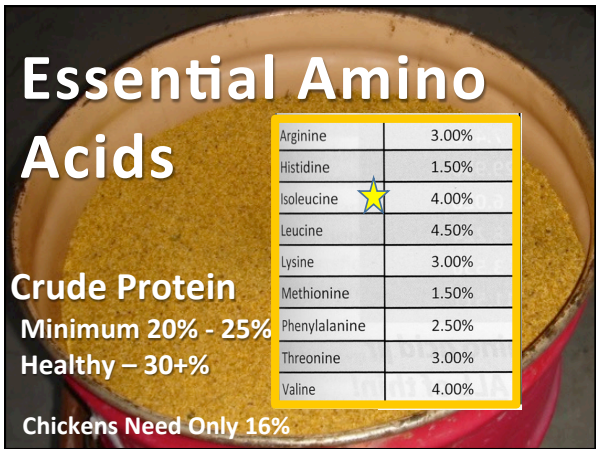
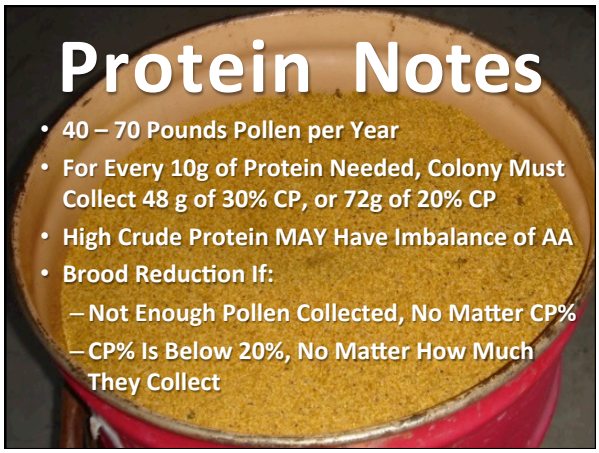
HONEY BEE NUTRITION

ENOUGH GOOD FOOD ALL OF THE TIME FOR EVERY BEE IN THE BUNCH


The Meat…


POLLEN
Fats
Vitamins
Minerals
And Especially
PROTEINS


Essential Amino Acids
Arginine 3.00%
Histidine 1.50%
Isoleucine 4.00%
Leucine 4.50%
Lysine 3.00%
Methionine 1.50%
Phenylalanine 2.50%
Threonine 3.00%
Valine 4.00%
Crude Protein
Minimum 20% - 25%
Healthy – 30+%
Chickens Need Only 16%


Protein Notes
• 40 – 70 Pounds Pollen per Year
• For Every 10g of Protein Needed, Colony Must Collect 48 g of 30% CP, or 72g of 20% CP
• High Crude Protein MAY Have Imbalance of AA
• Brood Reduction If:
– Not Enough Pollen Collected, No Matter CP%
– CP% Is Below 20%, No Matter How Much They Collect

Fats

- Cholesterol Needed For Brood Rearing
- Fats Are Highly Attractive To Foragers
- Have Some Microbial Activity
- High In Lipids
  - Fatty Acids, Sterols, and Phospholipids
    - Required For Membrane Growth
    - Linoleic Acid Inhibits AFB and EFB

Minerals

- Potassium, Phosphorous, and Magnesium Required By All Insects
- Sodium, Calcium and Sodium Chloride Detrimental
- 0.5% – 1.0% Ash Increases Brood Production
- But 2+% Reduces Brood Production
- And Over 8% Ash Stops Brood Production

Vitamins

- B Complex, A and K Essential For Hypopharyengeal Gland and Brood Development
- Vitamins Mostly Unstable In Storage, But Irradiated Pollen Will Last Longer

Pollen Deficiency

- Reduced Brood Production Overall
- Reduced Longevity Of Workers
- Longer For Drones To Reach Maturity
- Reduced Fertility Of Drones
- Drones Neglected, Discarded, or Eaten
- Fewer Drones = Poor Mating and Queen Supercedure
- Starvation

Some Common Pollen Sources

Canola - ~23% CP, Minimum+ AA
Buckwheat - ~11% CP, Minimum+ AA
Sunflower - ~15% CP, Minimum+ AA
Lavender - ~19% CP, Short on Isoleucine, rest OK
Alfalfa - ~21% CP, Short on Isoleucine and Methionine
Pine - ~7% CP
Almond - ~26%CP, Short on Methionine
Pear - ~26%CP, Minimum+ AA
Crude Protein, Minimum 20 -25%, 30+% Best

More…

Some Common Pollen Sources

Raspberry, Blackberry - ~20%CP, Min AA
Clover Sp - ~25% CP, Low Isoleucine
Blueberry – ~14% CP, Min AA
Beans Sp - ~22% CP, Min AA
Corn - ~15% CP, Min AA
Peas Sp - ~30% CP, Min+ AA
Willow Sp - ~18% CP, Barely Min AA
Locust - ~25% CP, Min+ AA
Crude Protein, Minimum 20 -25%, 30+% Best

… And Potatoes

NECTAR

- Carbohydrate Source
- Primarily Sucrose Sugar and Water
- Breaks Down To:
  - Fructose (Levulose)
  - Glucose (Dextrose), Promotes Crystalization
  - Water Must Be Reduced To Less Than 17% or Mixture Will Ferment
  - Minerals – Ca, Cu, K, Mg, Mn, Na, P, Zn

Nectar Notes

* 7 Other Sugars Found In Nectar
- Proteins, Amino Acids, Enzymes, lipids, Organic Acids, Vitimens and Antioxidants
- Sugar Concentration Ranges From 5% - 75 %, Average 25% - 40%

Nectar Notes

- 1 Worker Needs 11 mg Sugar/day
- 1 - 50M Colony Eats 1 Pound Of Sugar, or ½ Gallon of 25% Nectar/Day – Just For Adults
- 50M Colony – 350#s Sugar/Year
- People Average 22 TEASPOONS of Sugar/Day…77 Pounds/Year

Nectar Notes

- When Food Is Plentiful, Bees Get Fussy, When Short, They'll Take Anything
- Related Plant Families Have Similar Nectars

Nectar Notes

- Nectar Flows Stimulate Hygienic Behavior By Cleaning Brood Nest For Room
- Nectar Availability Stimulates Brood Production and Population Expansion
- Additional Brood Stimulates Pollen Collection

Nectar Deficiency

- Defensive Behavior Increases
- Fewer Pollen Foragers
- Reduced Hygienic Behavior = Higher Brood Disease Problems
- Reduced Brood, and Brood Nest Size
- Starvation

Water…

½ - 1 Gallon/Colony Each Day In The Hot Summer Months

Water…

Earth has about 370 MILLION TRILLION GALLONS of water
less than 12 MILLION TRILLION GALLONS (.003%) are useable
between 2.4 MILLION TRILLION and 3.7 MILLION TRILLION GALLONS (.001%) useable by humans because it is of adequate quality and accessible at acceptable cost.

64.4% of ALL water resources are found in just 13 countries

A growing number of countries are short of water with per capita availability of less than264,000 gallons per year…about 700 gallons/day Min

Minimum Daily Requirement to survive – 5 – 12 gallons/day … 1800 – 4400 gallons/annum UN

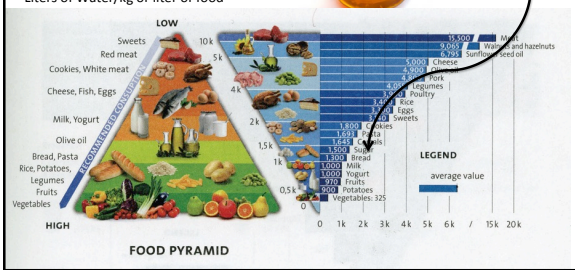
Used how…

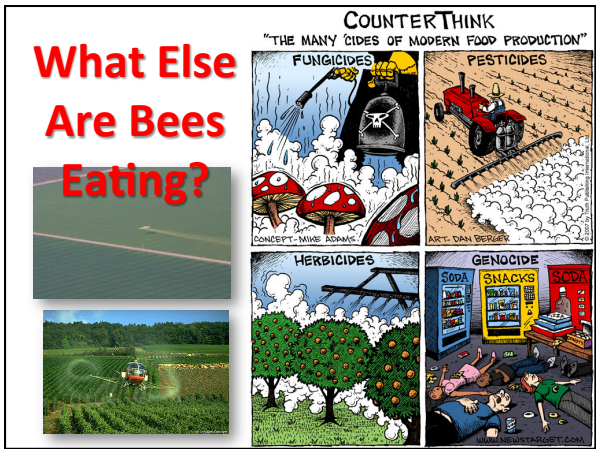
Agriculture – 70% of fresh water use (95% in developing countries)
Industry – 22% (59% in developed countries)
Domestic use – 8%

Virtual Water…

About 140 gallons of Water to Produce 1 pound of Honey

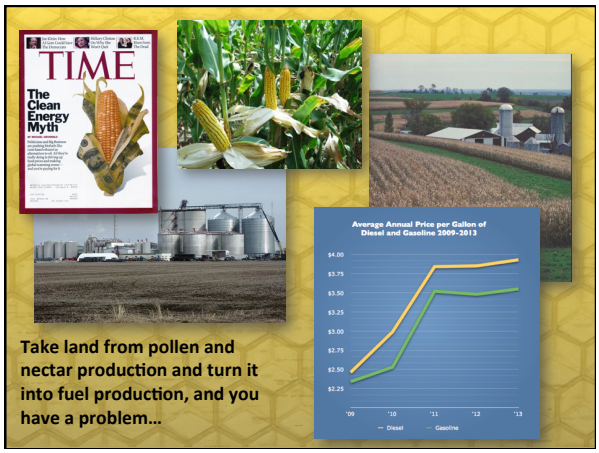
Liters of Water/kg or liter of food




What Else Are Bees Eating?
COUNTERTHINK
"THE MANY 'CIDES OF MODERN FOOD PRODUCTION"
FUNGICIDES
CONCEPT-MIKE ADAMS
PESTICIDES
ART. DAN BERGER
HERBICIDES
GENOCIDE
SODA
SNACKS
SODA


Monocultures Are Efficient For Food…


Development – Pavement Is The Last Crop
And people are getting farther away…

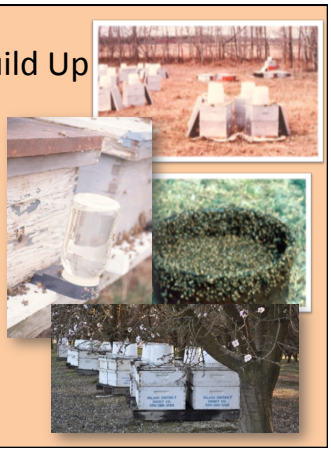

TIME
The Clean Energy Myth
Average Annual Price per Gallon of Diesel and Gasoline 2009-2013
Take land from pollen and nectar production and turn it into fuel production, and you have a problem…

Nutrition Management Why Are You Feeding?

- Spring Build Up
  - Sugar and Protein
- Package, Nuc or Split
  - Sugar and Protein
- Queen Production
  - Sugar and Protein
- To Encourage Pollen Collection
  - Sugar
- Nectar Dearth (Bad Weather, Poor Location)
  - Sugar, maybe Protein
- Boost Winter Stores
  - Sugar and Protein
- Emergency
  - Sugar

To Stimulate A Build Up

- Thin Mix – 1:1, or even 0.75:1.
- Feed Several Small Amounts Several Times, Rather Than 1 large Amount All At Once. Makes More Work, but Better Results
- Open Feeding…



Stimulation For Package, Nuc Or Split Feeding

Of Course, The Real Thing Is Always The Best Choice, If Available

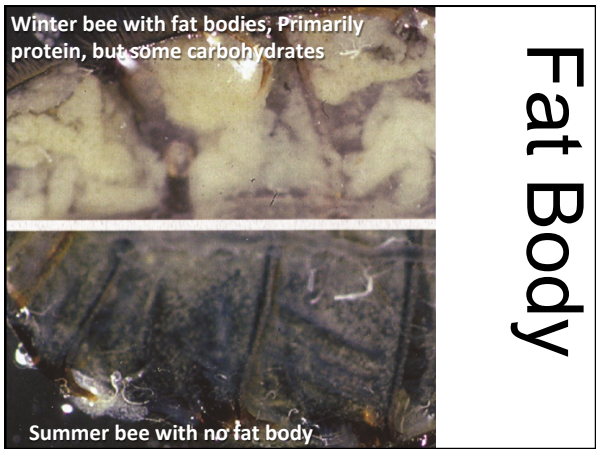
Making Queens Light Syrup Stimulation Gives Lots of Royal Jelly

To Store Sugar…

- Very Thick Syrup…2 parts sugar:1 water, or even ½ water
- Dry sugar crystals on inner cover, or in in-hive feeder
- Fondant patties
- Avoid Stimulating A Build-Up

All Of These Problems Are Preventable. Simply Put…Honey Bees Should Not Die Overwinter. If They Do, It Is A Mismanagement Problem by The Beekeeper

- Starvation - Not Enough Food
- Starvation - Food In The Wrong Place
- Becoming Wet From Condensation
- Some Pests and Diseases
- Not Enough Bees
- Simply Too Cold, For Too Long…No Matter How Many Bees, Or How Much Food



Fat Body

Both Of These Colonies Starved In March, But For Very Different Reasons..

HONEY BEE NUTRITION - ENOUGH GOOD FOOD ALL OF THE TIME FOR EVERY BEE IN THE BUNCH

Enough Good Food All Of The Time Is The Cheapest Insurance And The Best Medicine You Can Give Your Colony. Period.