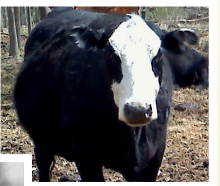
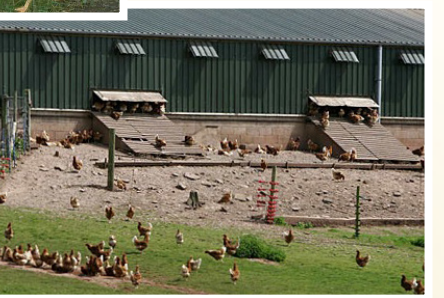
D.U.A.™ and D.U.A. G.R.P.™

Digestion Utilization Absorption





ADVANCED BIOLOGICAL CONCEPTS®

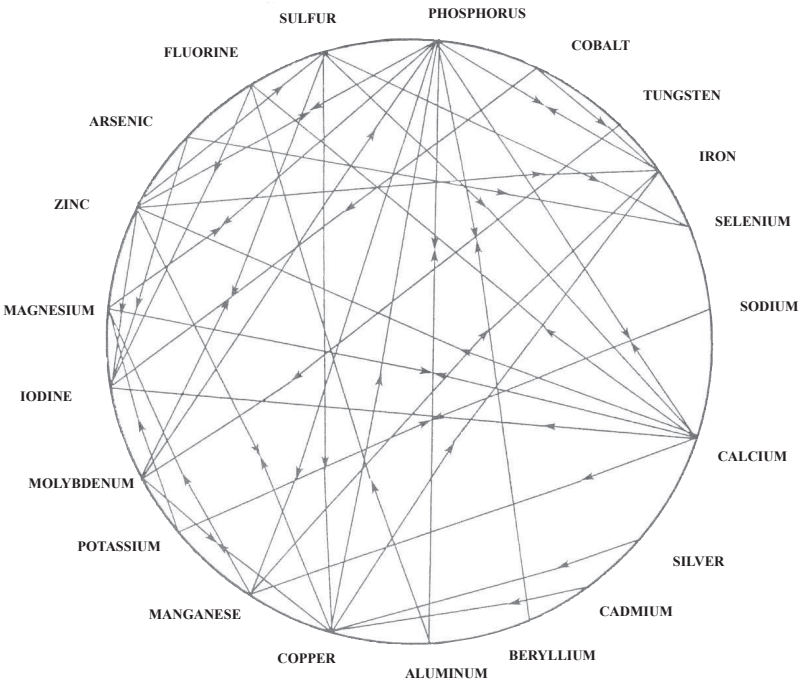
Conventional & Organic Livestock

USDA ORGANIC

The animal feed products listed in this catalog are **USDA** certified organic and are identified with the **USDA** organic seal. All other products contain only certified organic agricultural products or ingredients that conform to the **NOP's** national list of materials acceptable for **organic livestock production**.

ECO CERT®
Certified Organic by Ecocert

The Mineral World



Certified Organic by Ecocert SA

Our Mission:

To achieve maximum animal health with organic nutrients through Applied Common Sense, Technology and Services.

Advanced Biological Concepts® has been dedicated for over 45 years to providing producers with nutritional technology to achieve maximum animal health for the production of drug and hormone free meat and milk. We believe animal health problems are due to nutritional deficiencies and related environmental conditions.

Advanced Biological Concepts® offers a complete line of **USDA/NOP** organic livestock production products.

Certified Organic Processor/Handler #0207-003IN
Certified By: ECOCERT

FPD147

ADVANCED BIOLOGICAL CONCEPTS®

MISSION STATEMENT

Improve the quality of life for mankind; by improving the quality of life for animals through nutrition.

Guideline for Achieving Mission Statement:

1) Always focus on the **cause** of a disease or problem, not the symptom.
2) Refrain from Research and Development involved in symptom relief.
3) We believe most poor health problems in animals are due to a nutritional deficiency caused by the confinement of animals, thereby, limiting their access to a variety of nutritional ingredients.
4) Often improvement in health can be dramatic when furnishing a balanced diet or adding nutrients that are lacking in the animal's diet. Not unlike giving food to a starving animal, this creates a dramatic improvement in health. This mode of nutritionally assisting animals must not be confused with drug therapy or medicine. We do not prescribe replacing the body's own mode of action through supplementation with synthetic chemicals and artificial components. **We supply the body with what it needs to repair itself.**
5) We do not prescribe the use of poisons or mega doses of single nutrients to **enhance performance.**

For more information or to place an order, call us at **1-800-373-5971** and we will be happy to serve you.

James G. Helfter
Chief Executive Officer

Helfter Enterprises, Inc.
d.b.a.
Advanced Biological Concepts®

"TOMORROW'S TECHNOLOGY TODAY"

ADVANCED BIOLOGICAL CONCEPTS®
Applied Common Sense®

D.U.A.™

Dietary Nutritional Supplement for Dairy Cattle, Beef Cattle, Sheep, Goats, Swine, Poultry, and Llamas

USDA ORGANIC

GUARANTEED ANALYSIS

Crude Protein	(min)-------13.0 %	Phosphorus (P)	(min)----------1.00 %
Lysine	(min)-------0.05 %	Salt (NaCl)	(min)----------3.0 %
Methionine	(min)-------0.05 %	Salt (NaCl)	(max)----------3.5 %
Crude Fat	(min)--------4.5 %	Sodium (Na)	(min)----------1.00 %
Crude Fiber	(max)-------15.0 %	Sodium (Na)	(max)----------1.50 %
Acid Detergent Fiber (ADF)	(max)-------24.0 %	Copper (Cu)	(min)----------160 PPM
Calcium (Ca)	(min)--------5.0 %	Copper (Cu)	(max)----------300 PPM
Calcium (Ca)	(max)--------6.0 %	Zinc (Zn)	(min)----------300 PPM
		Vitamin A	(min)----180,000 IU/LB

INGREDIENT STATEMENT

This product contains only certified organic agricultural products or ingredients that conform to the NOP's national list of materials acceptable for organic livestock production.™

INGREDIENTS: Organic Dehydrated Alfalfa Meal, Organic Oat Groats, Organic Linseed Meal, Diatomaceous Earth, Calcium Carbonate (granular), Reed Sedge Peat, Calcium Carbonate (powder), Organic Soy Oil, Dicalcium Phosphate, Monosodium Phosphate, Sodium Bentonite, Organic Dried Kelp, Sodium Aluminosilicate, Sodium Bentonite (granular), Organic Soybeans, Salt, Organic Apple Cider Vinegar, Yeast Culture, Organic Dried Whole Milk, Organic Cane Sugar, Choline Chloride, Ascorbic Acid, Magnesium Oxide, Vitamin E, Manganous Oxide, Organic Cinnamon Powder, Zinc Sulfate, Citric Acid, Zinc Hydroxychloride, Riboflavin, Manganese Sulfate, Manganese Hydroxychloride, Potassium Chloride, Magnesium Sulfate, Organic Cloves Powder, Organic Yucca Liquid, Copper Sulfate Pentahydrate, Vitamin A Acetate, Basic Copper Chloride, Sodium Bicarbonate, Enzyme Product, Niacin, Calcium Hydroxide, Vitamin B12, Vitamin D3, Thiamine Mononitrate, Pyridoxine Hydrochloride, Organic Parsley Leaf, Organic Soy Lecithin, D-Calcium Pantothenate, Natural Vitamin E, Organic Horseradish Root Powder, Organic Coconut Oil, Organic Brown Flax Meal, Organic Orange Peel Powder, Ethylenediamine Dihydriodide, Organic Dried Tomato Powder, Organic Aloe Vera Oil, Organic Olive Oil, Organic Peppermint Leaf Powder, Ferrous Sulfate, Cobalt Sulfate Monohydrate, Organic Dandelion Root Powder, Organic Ginger Root Powder, Organic Calendula Flowers, Organic Fenugreek Seed Powder, Organic Garlic Granules, Organic Dandelion Leaf Powder, Organic Marshmallow Root Powder, Organic Sage Leaf Powder, Organic Fennel Seed Powder, Organic Gentian Root Powder, Organic Thyme Powder, Organic Lemongrass Powder, Organic Elderberry Powder, Organic Violet Leaf, Organic Licorice Root Powder, Organic Basil Powder

DIRECTIONS FOR USE:

DAIRY CATTLE:
Top Dress or Add Mix:
1/2 ounce (14.17 g) per head per day.

CALVES:
Top Dress or Add Mix:
1/2 ounce (14.17 g) per head per day.

BEEF CATTLE:
Top Dress or Add Mix:
1/4 ounce (7.09 g) per head per day.
Receiving:
Top Dress or Add Mix:
1/2 ounce (14.17 g) per head per day for 14 days.

SHEEP & GOATS:
Top Dress or Add Mix:
1/8 ounce (3.54 g) per head per day.

SWINE:
Finishing:
Add **3** Pounds Per Ton of Complete Ration.
Grower and Lactation:
Add **5** Pounds Per Ton of Complete Ration.
Starter and Gestation:
Add **7** Pounds Per Ton of Complete Ration.

POULTRY:
Starter:
Add **4** Pounds Per Ton of Complete Ration.
Complete Feed:
Add **2** Pounds Per Ton of Complete Ration.

LLAMAS / EMUS / ALPACAS:
Top Dress or Add Mix:
1/4 ounce (7.09 g) per head per day.

Manufactured for:
Advanced Biological Concepts®
P.O. Box 27 • Osco, Illinois 61274-0027
Phone: 800-373-5971 • **Fax:** 888-770-0735
jgh@a-b-c-plus.com • www.abcplus.biz

HELFTER FEEDS, INC.®

Certified Organic by: ECOCERT

FPD157-62

A037

Net Weight 25 Pounds (11.36 kg)

ADVANCED BIOLOGICAL CONCEPTS®
Page 4
Applied Common Sense

D.U.A.™ Pellets

Dietary Nutritional Supplement for Dairy Cattle,
Beef Cattle, Sheep, Goats, Swine, and Llamas

USDA ORGANIC

GUARANTEED ANALYSIS

Crude Protein	(min)--------11.0 %	Phosphorus (P)	(min)----------1.0 %
Lysine	(min)--------0.05 %	Salt (NaCl)	(min)----------2.5 %
Methionine	(min)--------0.05 %	Salt (NaCl)	(max)----------3.0 %
Crude Fat	(min)---------3.5 %	Sodium (Na)	(min)----------0.5 %
Crude Fiber	(max)-------10.0 %	Sodium (Na)	(max)----------1.0 %
Acid Detergent Fiber (ADF)	(max)-------32.0 %	Copper (Cu)	(min)----------500 PPM
Calcium (Ca)	(min)---------5.0 %	Copper (Cu)	(max)----------600 PPM
Calcium (Ca)	(max)---------6.0 %	Zinc (Zn)	(min)----------1500 PPM
		Vitamin A	(min)-----180,000 IU/LB

INGREDIENT STATEMENT

This product contains only certified organic agricultural products or ingredients that conform to the NOP's national list of materials acceptable for organic livestock production.™

INGREDIENTS:

Organic Dehydrated Alfalfa Meal, Organic Oat Groats, Organic Linseed Meal, Diatomaceous Earth, Calcium Carbonate (granular), Reed Sedge Peat, Calcium Carbonate (powder), Organic Soy Oil, Dicalcium Phosphate, Monosodium Phosphate, Sodium Bentonite, Organic Dried Kelp, Sodium Aluminosilicate, Sodium Bentonite (granular), Organic Soybeans, Salt, Organic Apple Cider Vinegar, Yeast Culture, Organic Dried Whole Milk, Organic Cane Sugar, Choline Chloride, Ascorbic Acid, Magnesium Oxide, Vitamin E, Manganous Oxide, Organic Cinnamon Powder, Zinc Sulfate, Citric Acid, Zinc Hydroxychloride, Riboflavin, Manganese Sulfate, Manganese Hydroxychloride, Potassium Chloride, Magnesium Sulfate, Organic Cloves Powder, Organic Yucca Liquid, Copper Sulfate Pentahydrate, Vitamin A Acetate, Basic Copper Chloride, Sodium Bicarbonate, Enzyme Product, Niacin, Calcium Hydroxide, Vitamin B12, Vitamin D3, Thiamine Mononitrate, Pyridoxine Hydrochloride, Organic Parsley Leaf, Organic Soy Lecithin, D-Calcium Pantothenate, Natural Vitamin E, Organic Horseradish Root Powder, Organic Coconut Oil, Organic Brown Flax Meal, Organic Orange Peel Powder, Ethylenediamine Dihydriodide, Organic Dried Tomato Powder, Organic Aloe Vera Oil, Organic Olive Oil, Organic Peppermint Leaf Powder, Ferrous Sulfate, Cobalt Sulfate Monohydrate, Organic Dandelion Root Powder, Organic Ginger Root Powder, Organic Calendula Flowers, Organic Fenugreek Seed Powder, Organic Garlic Granules, Organic Dandelion Leaf Powder, Organic Marshmallow Root Powder, Organic Sage Leaf Powder, Organic Fennel Seed Powder, Organic Gentian Root Powder, Organic Thyme Powder, Organic Lemongrass Powder, Organic Elderberry Powder, Organic Violet Leaf, Organic Licorice Root Powder, Organic Basil Powder

DIRECTIONS FOR USE:

DAIRY CATTLE:
Top Dress or Add Mix:
1 ounce (28.35 g) per head per day.

CALVES:
Top Dress or Add Mix:
1 ounce (28.35 g) per head per day.

BEEF CATTLE:
Top Dress or Add Mix:
1/2 ounce (14.17 g) per head per day.
Receiving:
Top Dress or Add Mix:
1 ounce (28.35 g) per head per day
for 14 days.

SHEEP & GOATS:
Top Dress or Add Mix:
1/4 ounce (7.09 g) per head per day.

SWINE:
Finishing:
Add **6** Pounds Per Ton of Complete Ration.
Grower and Lactation:
Add **10** Pounds Per Ton of Complete Ration.
Starter and Gestation:
Add **14** Pounds Per Ton of Complete Ration.

LLAMAS / EMUS / ALPACAS:
Top Dress or Add Mix:
1/2 ounce (14.17 g) per head per day.

2 oz. (60 cc) Scoop Included

Manufactured for:
Advanced Biological Concepts®
P.O. Box 27 • Osco, Illinois 61274-0027
Phone: 800-373-5971 • **Fax:** 888-770-0735
jgh@a-b-c-plus.com • www.abcplus.biz
Certified Organic by: ECOCERT

Cold Pelleting Process
Never Over 110°F
Enzymes Preserved

FPD31-46

A039

Net Weight 25 Pounds (11.36 kg)

D.U.A.™

D.U.A.™ = Digestion, Utilization, Absorption
Helps to improve fiber digestion.

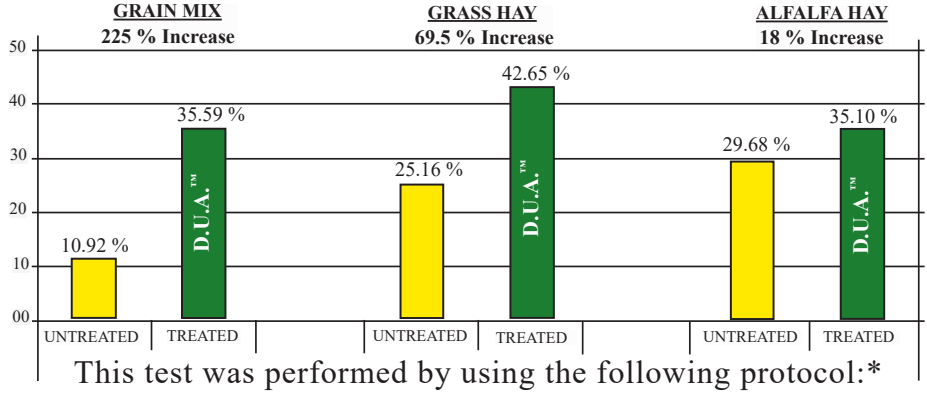
Aids in increasing **mineral** and **protein** assimilation.

Benefits of this type of Mineral:

Highly available **single molecule**, **chelated** to carbon (sugar) by the plant. This is the type of **mineral** that **animals** were **meant to live on**.

Study: Neutral Detergent Fiber Digestion

Independent Lab studies of **D.U.A.**™ effect on digestion of **N**eutral **D**etergent **F**iber **D**igestion yielded the following results.



This test was performed by using the following protocol:*

GRAIN MIX
Control grain mix / fiber digestion = 10.92 %
D.U.A.™ added / fiber digestion = 35.59 %
increase = 225 %

GRASS HAY
Control grass hay / fiber digestion = 25.16 %
D.U.A.™ added / fiber digestion = 42.65 %
increase = 69.5 %

ALFALFA HAY
Control alfalfa hay / fiber digestion = 29.68 %
D.U.A.™ added / fiber digestion = 35.10 %
increase = 18 %

*These numbers were obtained through Invitro procedures.

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jgh@a-b-c-plus.com • www.abcplus.biz

PROFIT WITH D.U.A.™

DAIRY: Producers in the dairy industry have shown:

Using **D.U.A.™** at the **½ oz/hd/day** in your dairy ration helps increase the utilization of protein in the diet equal to the level of 3.1 pounds of **Soybean Meal** (48%).

Removal of Soybean Meal, 3.1 pounds @ .58/ pound	**= $1.798**
Inclusion of **D.U.A.™** ½ oz/hd/day	= $.0978
Savings	= $1.70

For every **$1.00** invested in **D.U.A.™**, you **SAVE $18.36**!

If ½ oz/hd/day saves 3.1 pounds of **Soybean Meal**, then 1 bag of **D.U.A.™** saves **4,960 pounds (almost 2.5 ton) of Soybean Meal**.

PROTOCOL:

D.U.A.™

(**D**igestive **U**tilization **A**bsorption)

&

FREE CHOICE MINERALS

D.U.A.™ helps to increase digestion of fiber!

Fiber contains the major minerals, as well as minors.

D.U.A.™ helps to make **Free Choice Minerals** more available; this all means **less usage** and **greater profit** for you, the **Producer**.

Disclaimer: *This product is formulated to meet the requirements of the USDA National Organic Program. Advanced Biological Concepts® accepts no responsibility for performance failure or misuse of this product, or changes of organic protocol that we are not aware of.*

D.U.A.™ Beef Feed Performance Test

Performed by: **MEXICALI CATTLE CO.**
Major Livestock Product Distributor
"Serving the Animal Industry"

Control Group
60 Days on Feed
217 Head
Average Weight = 283 lbs.
Average Gain = 2 lbs. per day

D.U.A.™
60 Days on Feed
816 Head
Average Weight = 264 lbs.
Average Gain = 2.7 lbs. per day
35 % Increase in ADG

42 lbs. More Gain Per Head

D.U.A.™ Cattle Test Results

Incoming Cattle - 28 Day Tests
Feed Efficiency and Rate of Gain Recap from Farm Testing

Oregon	**Control**	**Treatment**	**Improvement**
Steers on test	120	135	--------
Feed fed per lb. of gain	8.10	7.14	11.0 %
Daily gain	3.65	4.10	12.0 %
Nevada	**Control**	**Treatment**	**Improvement**
Steers on test	36	35	--------
Feed fed per lb. of gain	8.75	8.00	8.6 %
Daily gain	3.95	4.38	11.0 %
California	**Control**	**Treatment**	**Improvement**
Steers on test	35	35	--------
Feed fed per lb. of gain	7.20	6.80	5.6 %
Daily gain	3.90	4.30	9.0 %
California	**Control**	**Treatment**	**Improvement**
Steers on test	105	105	--------
Feed fed per lb. of gain	7.90	7.10	10.0 %
Daily gain	3.60	3.95	10.0 %
California	**Control**	**Treatment**	**Improvement**
Heifers on test	67	63	--------
Feed fed per lb. of gain	7.50	7.00	6.7 %
Daily gain	3.50	3.85	10.0 %

SLAUGHTER RESULTS with **D.U.A.™**

Group 1

	Body Weight	% Dress
73 Heifers	79,500	64.17
23 Steers	24,180	66.18*
96 Total	103,680	
2% Shrink	2,074	
	101,610	
65.03%		

ALL GRADED CHOICE, NO REJECTED LIVERS

**Sandunsky Beef Co. commented on the excellent cutability on this group of feedlot cattle as very rare and usually found in show cattle*

Group 2

	Body Weight	% Dress
79 Heifers	81,090	63.85
10 Steers	12,390	65.93
89 Total	93,480	
2% Shrink	1,870	
	91,610	65.21%

Group 3

	Body Weight	% Dress
54 Heifers	52,390	64.94

The producer indicated on the previous page, is a dealer for **Advanced Biological Concepts®** and finishes out 500-700 cattle per year. He usually receives cattle at weights of 750 pounds. He was already into this group of feeders when we introduced **D.U.A.™** into the feeding program. Included below is **Advanced Biological Concepts®** all natural receiving and feeding program.

I. RECEIVING PROGRAM

1. Dry Hay for 12-14 days.
2. ½ pound per day Kickoff Starter Pellet plus **D.U.A.™** for 30 days. 1 pound per day 42% Beef supplement (MGA) Co-op.
3. Haylage started with 1 pound oats.
4. 5th Day - 1 pound corn increase 1 pound every day 3 days - 2 pounds oats (30 days).
5. 30 days - Kickoff Starter plus **D.U.A.™** reduced to ¼ pound per head per day.

II. 2 MONTHS - March

1. Cough started - Aureo 700 fed for 10 days.
2. **D.U.A.™** introduced at ¼ ounce per head per day. Aureo discontinued.
3. After 2 weeks corn was able to be increased am additional 3 pounds from 23 pounds to 26 pounds.

D.U.A.™ Testimonial

Last winter, we had some home raised calves that were slow and not responsive to traditional antibiotics. An **Advanced Biological Concepts®** representative introduced us to a product called **D.U.A.™**

We began adding **D.U.A.™** to the calves feed and within 2 weeks the calves had a better appetite and smoother hair coats. We probably would have lost most of these calves or they wouldn't have been worth much, if we hadn't added **D.U.A.™** to their feed.

Clayton

BOVINE TEST CENTER

Bovine Test Center Senior Bull Test 56 Days

	Control	D.U.A.™
No. of Bulls	11	26
Days of Feed	56	56
Average Start Weight	1071	1171
Average Finish Weight	1295	1411
Average Gain	223.8	240
Average Daily Gain	4.0	4.28
Average Daily Lb./Feed	40.44	30.58
Feed / Lb. Gain	10.1	7.14
Cost Per Day	3.23	2.45
Cost of **D.U.A.**™	--------	.015
Total Cost / Head / Day	3.23	2.465

A feed saving of $0.75 per head per day plus a 7% increase in weight gain.

Milk producers need increased profits, which are not always achieved by increased production.

Increased profit margins can come through better management of off the farm dairy cost.

D.U.A.™ stimulates appetite so cows stay on feed better, convert protein better (so less off the farm protein is needed), and get maximum utilization from your grain and forage.

I find most producers are looking for better ways of lifting the stress of heavy production in their dairies. At the same time they want to get away from drugs and antibiotics. Many are using several expensive stress packs to accomplish this. I recommend **D.U.A.**™ to do this job.

Using **D.U.A.**™ as the single off the farm stress fighter makes for easier feeding and greater profits.

William D. Johnson
Dairy Consultant / Owner of WDJ Enterprises, Inc.

ADVANCED BIOLOGICAL CONCEPTS®
Applied Common Sense®

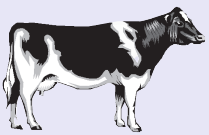
DRUG FREE PRODUCTS FOR LIVESTOCK

Less Protein, More Production

19% Crude protein ration was being used in a herd where the daily average milk production per cow was 80 pounds. The crude protein was dropped to 18% and **D.U.A.**™ was added at a daily rate of 1/4 ounce per cow. In a weeks time, changes in the milk production were not noticed. The following week, **D.U.A.**™ was increased to a daily rate of 1/2 ounce per cow. The cow's manure became loose due to the protein levels.

Therefore, the crude protein level was dropped to 17%. In thirty days, the daily milk production increased to 88 pounds per cow.

Conception Rates



In an operation with 120 replacement heifers, the heifers are divided into several groups ranging in size. Their sizes vary from 400 pounds to 1,100 pounds. **D.U.A.**™ has been included into the ration at a daily rate of 1/2 ounce per head. All antibiotics have been removed. Since the inclusion of **D.U.A.**™ and the removal of all antibiotics, and within a period of 90 days, there has been improved health and improved conception rate at breeding time.

D.U.A.™ Poultry Results

Farm Test with 80,000 Laying Hens

	Control	D.U.A.™
Feed Conversion per 100 birds	23.00 lbs.	21.50 lbs.
Death Loss	3.00 %	.75 %

Hyline #36 Laying Hens

	Flock #1	Flock #2
Number of Birds per Flock	147,796	145,600
Average Mortality Rate 1-44 Weeks	8.4 %	17.8 %
Egg Production at Week 44	83 %	78.4 %
D.U.A.™ was added at Week 44		
Average Mortality Week 44-78	7 %	6.4 %
Egg Production at Week 78	65 %	71 %
Life Time Feed Consumption / 100 Birds	21.7 lbs.	21.4 lbs.

Benefits of D.U.A.™

After adding one pound per ton to Flock #2 at Week 44

Increased Egg Production by 6.7% compared to Flock #1

FPD166-3

D.U.A.™ Turkey Results

These test results were accumulated from a TURKEY producer who raises organic birds Without Medications.

He began using **D.U.A.™** approximately half way through the feeding period. Before this time, his biggest loss occurred in the first 30 days and his second biggest loss came at processing, in the form of condemned birds. His inspector told him he was far below industry standards on the one group this past year.

Turkeys are tanked for three main reasons:
(1) Sinuvitis (2) Septicemia (3) Air Sacculitis

Out of 2,260 birds delivered for slaughter, 195 head (8.6%) without **D.U.A.™** were tanked. Of the birds with **D.U.A.™**, only 28 head (1.2%) were tanked.

Test Results

	Sinuvitis	Septicemia	Aie Scculitis
Number tanked without **D.U.A.™**	21 head	53 head	121 head
Number tanked with **D.U.A.™**	9 head	16 head	3 head

The producer comments that without a doubt he will use **D.U.A.™** all the way through the year because of its cost effectiveness and performance results.

Digestion Utilization Absorption

D.U.A.™

A key alternative for total silage management

D.U.A.™ out performed the competition by

in reduction of yeast.

D.U.A.™ reduces pH in your silage faster than any other product on the market.

Yeast control is the one **most critical components of the process** that **preserves** the **silage** and **prevents spoilage during feedout.**

D.U.A.™ is in a form which allows 100% coverage and immediate production of lactic acid, which drops the pH and slows down yeast production. Competitive products are pelleted which have to break down before production of lactic acid can begin.

Why is this important?

From a practical view, the three most important things that must occur in order to make good silage are:

1. The rapid removal of air.
2. The **rapid production of lactic acid that results in a rapid drop in pH**.
3. Continued exclusion of air from the silage mass during storage and feedout.

A quick reduction in silage pH limits the breakdown of protein in the silo by inactivating plant proteases. In addition, a rapid decrease in pH will **inhibit** the **growth** of **undesirable anaerobic microorganisms** such as enterobacteria and clostridia. Eventually, continued production of lactic acid and a decrease in pH inhibits the growth of all bacteria.

A common **misconception** is that **molds are responsible** for **spoilage of silage** when it is exposed to air. However, **yeasts (not molds)** are the **primary microorganisms** that **cause** aerobic **spoilage** and **heating.** When exposed to air, yeast metabolizes lactic acid that causes the pH of the silage to increase, thus allowing bacteria, that were inhibited by low pH, to grow and further spoil the mass.

FPD165-2

Digestion Utilization Absorption D.U.A.™

A key alternative for total swine management

What can D.U.A.™ do for your swine feeding program?

- May enhance **fermentation** and **protein digestion**
- Can contribute more positive energy available for growth
- **Additional** available **Nitrogen** to your **lagoon**
- Addresses manure management **environmental issues**

Protein Savings Using D.U.A.™ Added to Feed for 8,500 Head of Grower and Finisher

Protein Reduction by the use of **D.U.A.™** (1%) (**D.U.A.™** Soymeal Savings) =	$12,900.00
Cost of corn to replace soymeal	- $4,128.00
Total Protein Savings is	**=$8,772.00**

Manure Management - Savings in Fertilizer Costs

Manure is not a waste product, but a **valuable fertilizer** source at no additional costs.

Digestion Utilization Absorption
D.U.A.™

A key alternative for total swine management

Profit from D.U.A.™ in a 8,500 Head, 4,000,000 Gallon Swine Lagoon

D.U.A.™ added $10.12 per 1,000 gallon of available nitrogen.
A **total increase** value of the lagoon was **$40, 480.00**
(using $300.00 per ton for 28% Nitrogen)

Profit Per Hog Using D.U.A.™

Farrow to Finish data compiled by a Iowa Master Pork Producer.

27.8 Pounds more per Pig to market @ $0.50 Market = $13.90
45.0 Pounds less feed per Pig to market @ $0.064 per pound = $ 2.88
Total = $16.78

$16.78 More Profit Per Hog

Cost of D.U.A.™ for 8,500 Hogs $23,730.00

Protein Savings	**$8,772.00**
Lagoon Profit	**$40,480.00**

Total Profit when using D.U.A.™ $25,522.00

For every dollar invested in D.U.A.™ there is a $2.00 Return

Based on **past performance data,** potential additional **profit is $16.78 per pig**.

FPD161-2

D.U.A.™ Results

4,000,000 Gallon Liquid Manure Swine Lagoon

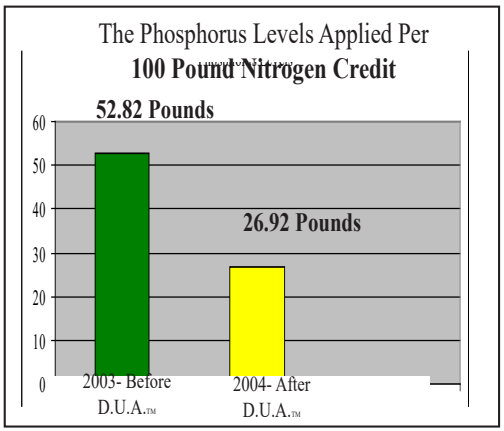
How does D.U.A.™ increase nitrogen values?

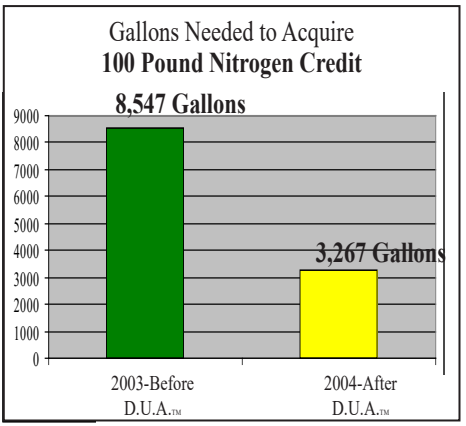
D.U.A.™ reduces denitrification. **D.U.A.™** proprietary process influences aerobic bacteria colonization and oxygen, increasing nitrification of organic waste. This proprietary process retards the vaporizing of N_2O and NO gases. The result of this process is the increase in value of the lagoon or slurry manure.

	Prior to using **D.U.A.™** Nitrogen (Na) / Phosphorous (P) **Ratio is 1.89**	After 6 months **D.U.A.™** Nitrogen (Na) / Phosphorous (P) **Ratio is 3.71**
Nitrogen	Total Lbs./1,000 Gallons	Total Lbs./1,000 Gallons
Organic N	1.8 lbs.	4.5 lbs.
Ammonium- N	9.9 lbs.	**26.1 lbs.**
Total Nitrogen	**11.70 lbs.**	**30.6 lbs.**

Phosphorous	6.08 lbs	8.24 lbs.
Potassium	7.56 lbs.	18.36 lbs.

Moisture	99.2 %	97.6 %
Solids	0.8 %	**4.4 %**
Organic Matter	46.74 lbs.	142.18 lbs.





FPD162-2

To decide the amount of liquid manure needed to apply per acre for fertilizer credit, samples were taken prior to the application in 2003 without the use of **D.U.A.™** and in 2004 after feeding **D.U.A.™** for approximately 6 months in a 1,000 sow operation.

Approximately 4,000,000 gallons were pumped from the test lagoon each year and liquid manure analysis were acquired to exhibit amounts of nutrients for crop production.

In the example above, notice that to acquire the same nitrogen levels per acre there is a significant reduction in gallons needed to apply.

Also notice the significant reduction in phosphorus levels when comparing nitrogen levels pound-for-pound per acre.

Example: 2003 total nitrogen (no D.U.A.) 11.70/1,000 Gallons

100 pounds of nitrogen credit needed for crop production:

2003 analysis 100 pounds divided by 11.70 pounds/1,000 gallons = 8.547 or 8,547 gallons per acre needed to acquire a 100 pound nitrogen credit.

Phosphorus levels applied at this amount would be 8.547 x 6.18 pounds/1,000 = 52.82 pounds of phosphorus.

Example: 2004 total nitrogen (D.U.A. fed for 6 months) 30.60/1,000 Gallons

100 pounds of nitrogen credit needed for crop production:

2004 analysis 100 pounds divided by 30.60 pounds/1,000 gallons = 3.267 or 3,267 gallons per acre needed to acquire a 100 pound nitrogen credit.

Phosphorus levels applied at this amount would be 3.267 x 8.24 pounds /1,000 = 26.92 pounds of phosphorus.

The result is a 50% reduction in phosphorus when acquiring the same nitrogen credit per acre.

When comparing identical nitrogen credit like 100 pounds per acre, the number of acres to be applied from the 4,000,000 gallon test lagoon, is a large difference.

No D.U.A. 2003
4,000,000 divided by 8,547 gallons per acre = 468 acres

D.U.A. 2004
4,000,000 divided by 3,267 gallons per acre = 1,224 acres

D.U.A.™ exhibits a significant difference for nitrogen credits with added beneficial value of lower salt index and phosphorus levels to soils for crop production.

Benefits of Increased Organic Matter in Animal Waste

D.U.A.™ increases Organic Matter by 300%

Organic Matter = Major Key to Soil Productivity

Organic matter is the source of energy for soil organisms as they multiply and carry on their life process. Ammonia produced during mineralization may then be nitrified to NO_3 (nitrate) by nitrifying bacteria.

These are some of the benefits from **increased organic matter** in animal waste being applied to agricultural lands. In a study done in a four million gallon liquid swine manure lagoon, **D.U.A.™** was fed through the facility for a period of six months; the result was a substantial increase of the nutrient value of the manure. **Organic matter increased by 300%.**

Benefits of Organic Matter:

- Helps build stable soil aggregates improving soil structure and tilth.
- Improves aeration and water penetration.
- Improves moisture holding capacity.
- Provides an abundance of negatively charged colloidal particles (humus) capable of holding and exchanging nutritive rations.
- Acts as a buffering agent by decreasing the tendency for an abrupt pH change in the soil when acid or alkaline forming substances are added.
- Stabilizes soil micronutrients that otherwise might not be available.
- Provides a source of numerous plant nutrients.

FPD239-3

Results from the study to determine effects of DUA™ on Growth, Performance and Nutrient Digestibility.

1. Experimental animal: 90 young pigs (BW 11.64 kg)
2. Duration: 21 days
3. Experimental design: 5 heads/6 replicates/3 treatments
   1) NC: Negative control (Antibiotics Free diet)
2) PC: Positive control: Antibiotics included diet, OTC 100 ppm, CTC 100 ppm

Table 1. Growth performance

Item	NC1	PC1	NDU1	SE2
Initial BW, kg	11.69	11.61	11.60	0.03
Finish BW, kg	22.25	22.42	22.31	0.38
ADG, g	502.86	514.76	510.00	16.91
ADFI, g	558.33	556.83	610.50	21.59
Gain/feed	0.901ab	0.924a	0.835b	0.02

[1] NC: Antibiotics Free; PC: Antibiotics included diet; NDU: NC + DUA.
[2] Pooled standard error.
[ab] Means in the same row with difference superscripts differ (P<0.05).
Sulfathiazole 100 ppm, Penicillin 50 ppm)

3) NDU: NC + DUA 0.35%

Table 2. Nutrient digestibility

Item, %	NC1	PC1	NDU1	SE2
DM	74.48c	78.91b	79.40ab	0.86
N	69.59c	73.86b	75.77ab	1.30

[1] NC: Antibiotics Free; PC: Antibiotics included diet; NDU: NC + DUA.
[2] Pooled standard error.
[ab] Means in the same row with difference superscripts differ (P<0.05).

Table 3. Fecal consistency score

Item	NC1	PC1	NDU1
No. of pigs	30	30	30
0 day	3(1.50) 2	2(1.50)	2(1.50)
7 days	4(1.50)	1(1.00)	2(1.20)
14 days	2(0.56)	1(0.50)	1(0.40)
21 days	1(0.50)	0(0.20)	0(0.23)

[1] NC: Antibiotics Free; PC: Antibiotics included diet; NDU: NC + DUA.
[2]Fecal score is the mean fecal consistency score:
0, normal; 1, soft feces: 2, mild diarrhea: 3, severe diarrhea.
Values in brackets represent mean fecal score

Results could be drastically modified, utilizing the technology and benefits of DUA™.

In table one and two, we would normally run at 50 ppm of OTC and CTC, when DUA is incorporated, on chronically sick animals. As a prevention, we would run 10 ppm.

In table three, it is evident that the ration, at minimum, 10% high on protein. In the NC group the protein level is, at a minimum, 20% too high during the first 14 days.

In other words, the protein level caused inflammation of the intestinal wall producing a higher level of water content in the gut, increasing intestinal transit time – lowering feed efficiency.

- Jim

Also Available:

ADVANCED BIOLOGICAL CONCEPTS®
Applied Common Sense®

D.U.A. G.R.P.™

USDA ORGANIC

Dietary Nutritional Supplement for Dairy Cattle, Beef Cattle, Sheep, Goats, Swine, Poultry, and Llamas

GUARANTEED ANALYSIS

Crude Protein	(min)----------12.0 %	Phosphorus (P)	(min)----------1.0 %
Lysine	(min)----------0.05 %	Salt (NaCl)	(min)----------3.0 %
Methionine	(min)----------0.05 %	Salt (NaCl)	(max)----------3.5 %
Crude Fat	(min)----------3.5 %	Sodium (Na)	(min)----------1.0 %
Crude Fiber	(max)---------15.0 %	Sodium (Na)	(max)----------1.5 %
Acid Detergent Fiber (ADF)	(max)---------32.0 %	Copper (Cu)	(min)----------500 PPM
Calcium (Ca)	(min)----------5.0 %	Copper (Cu)	(max)----------600 PPM

INGREDIENT STATEMENT

This product contains only certified organic agricultural products or ingredients that conform to the NOP's national list of materials acceptable for organic livestock production.™

INGREDIENTS:

Organic Dehydrated Alfalfa Meal, Organic Oat Groats, Organic Linseed Meal, Diatomaceous Earth, Calcium Carbonate (granular), Reed Sedge Peat, Calcium Carbonate (powder), Organic Soy Oil, Dicalcium Phosphate, Monosodium Phosphate, Sodium Bentonite, Organic Dried Kelp, Sodium Aluminosilicate, Sodium Bentonite (granular), Organic Soybeans, Salt, Organic Apple Cider Vinegar, Yeast Culture, Organic Dried Whole Milk, Organic Cane Sugar, Choline Chloride, Ascorbic Acid, Magnesium Oxide, Vitamin E, Manganous Oxide, Organic Cinnamon Powder, Zinc Sulfate, Citric Acid, Zinc Hydroxychloride, Riboflavin, Manganese Sulfate, Manganese Hydroxychloride, Potassium Chloride, Magnesium Sulfate, Organic Cloves Powder, Organic Yucca Liquid, Copper Sulfate Pentahydrate, Vitamin A Acetate, Basic Copper Chloride, Sodium Bicarbonate, Enzyme Product, Niacin, Calcium Hydroxide, Vitamin B12, Vitamin D3, Thiamine Mononitrate, Pyridoxine Hydrochloride, Organic Parsley Leaf, Organic Soy Lecithin, D-Calcium Pantothenate, Natural Vitamin E, Organic Horseradish Root Powder, Organic Coconut Oil, Organic Brown Flax Meal, Organic Orange Peel Powder, Ethylenediamine Dihydriodide, Organic Dried Tomato Powder, Organic Aloe Vera Oil, Organic Olive Oil, Organic Peppermint Leaf Powder, Ferrous Sulfate, Cobalt Sulfate Monohydrate, Organic Dandelion Root Powder, Organic Ginger Root Powder, Organic Calendula Flowers, Organic Fenugreek Seed Powder, Organic Garlic Granules, Organic Dandelion Leaf Powder, Organic Marshmallow Root Powder, Organic Sage Leaf Powder, Organic Fennel Seed Powder, Organic Gentian Root Powder, Organic Thyme Powder, Organic Lemongrass Powder, Organic Elderberry Powder, Organic Violet Leaf, Organic Licorice Root Powder, Organic Basil Powder

DIRECTIONS FOR USE:

DAIRY CATTLE:
Top Dress or Add Mix:
1/2 ounce (14.17 g) per head per day.

CALVES:
Top Dress or Add Mix:
1/2 ounce (14.17 g) per head per day.

BEEF CATTLE:
Top Dress or Add Mix:
1/4 ounce (7.09 g) per head per day.

Receiving:
Top Dress or Add Mix:
1/2 ounce (14.17 g) per head per day for 14 days.

SHEEP & GOATS:
Top Dress or Add Mix:
1/8 ounce (3.54 g) per head per day.

SWINE:
Finishing:
Add **3** Pounds Per Ton of Complete Ration.

Grower and Lactation:
Add **5** Pounds Per Ton of Complete Ration.

Starter and Gestation:
Add **7** Pounds Per Ton of Complete Ration.

POULTRY:
Starter:
Add **4** Pounds Per Ton of Complete Ration.

Complete Feed:
Add **2** Pounds Per Ton of Complete Ration.

LLAMAS / EMUS / ALPACAS:
Top Dress or Add Mix:
1/4 ounce (7.09 g) per head per day.

Manufactured for:
Advanced Biological Concepts®
P.O. Box 27 • Osco, Illinois 61274-0027
Phone: 800-373-5971 • **Fax:** 888-770-0735
Certified Organic by: ECOCERT

A101

FPD680-30

Net Weight 25 Pounds (11.36 kg)

Disclaimer: *This product is formulated to meet the requirements of the USDA National Organic Program. Advanced Biological Concepts® accepts no responsibility for performance failure or misuse of this product, or changes of organic protocol that we are not*

Addressing the Negative Effects of GMOs and Glyphosate

D.U.A.™ + G.R.P.™ Technologies

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