University of California
Agricultural Extension Service
Madera County

HYDROPONICALLY GROWN GRASS
ITS PRODUCTION, LABORATORY ANALYSIS AND ESTIMATED FEED VALUE

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During the dates of January 10 and January 16 three hydroponics units in California were visited by the author. During these visits the daily output of hydroponically grown grass was determined by weighing each tray of grass grown for harvest at that time. A small sample of total growth consisting of the grass, barley hulls, root system, and paper pad was taken from each tray of grass, placed in double plastic bags and sealed. This method was employed at each of the three units. This material was subsequently dehydrated in drying ovens to determine moisture content of the material.

The amount of whole barley that was put on to soak to produce a subsequent crop of grass was also weighed by the author after the operator of each unit had measured the barley seed into its respective containers.

The oven dry sample and a sample from the seed barley used in producing the sampled grass was sent to the University of California Agricultural Extension laboratory at Davis for an analysis of crude protein, crude fat, crude fiber, and ash.

The results of these field studies and laboratory analysis are included in the following tables:

Table I

→ Daily production of grass (in pounds) →

	Unit 1	Unit 2	Unit 3
Rated by company (daily output)	1000#	500#	2000#
Actual production	550#	323#	743#
Per cent moisture of total growth	89%	87%	85%
Per cent dry material	11%	13%	15%

Table II

Conversion rate of dry matter in grain to dry matter in grass in the units.

Input	Produced			
	Pounds of dry matter in grass			
	Unit 1	Unit 2	Unit 3	Average
100 pounds of dry matter in barley	67#	64#	76#	69#

Table III

Laboratory analysis of dry matter in grain and subsequently produced Hydro-grass (oven dry material).

	Barley Seed	Hydro-grass
Crude Protein	11.9%	14.4%
Crude Fat	2.4	3.1
Crude Fiber	8.9	15.6
Ash	3.8	4.7

From extensive feeding and digestion trials, it's well established that rolled or ground barley will furnish about 80 therms (1 therm = 1000 large calories) of net energy to a dairy cow per 100 pounds of its dry matter. From the above "Feed Tag" analysis we can "Guestimate" the net energy supplied by 100 pounds of the dry matter in Hydro-grass. A liberal figure for this feedstuff would be 65 therms of N.E./100# of dry matter.

Contrary to a relatively few expressed opinions, it is not the mystic qualities of a feed stuff that put pounds of gain on beef, hogs, sheep, and pounds of milk in the tank from a dairy cow. It is simply an ample supply of net energy balanced with enough protein, vitamins, and minerals to allow the supplied net energy intake to do its job.

The protein needed comes from most of our common feedstuffs. The cereal grains furnish some. A large amount is supplied by alfalfa hay and pasture grass in the case of cattle and sheep. High levels may be obtained from protein supplements such as cottonseed meal, linseed meal, soybean meal, meat scraps, and others if high levels are required.

The vitamins and minerals are usually amply available in our common feedstuffs. This is particularly true of good quality roughage. In instances where there is reason to suspect dangerously low levels of vitamins and minerals, or that their use in the animal body may be inhibited by complex interactions, they can readily be supplied in ample amounts and at very low daily cost by fortification of the ration in question.

These are not merely statements but are sound facts borne out by our many thousands of feed lots and dairies over the nation that are getting phenomenal production results based upon the foregoing feed facts. This knowledge was developed through thousands upon thousands of research hours and feeding trials conducted by competent scientists in both industry and the universities throughout the world.

Based upon the net energy values and costs of various common feedstuffs, the last table (4) will demonstrate the cost of one therm of net energy in these feedstuffs and hydroponically grown grass using current feed prices.

Table IV

Net energy costs of various feedstuffs.

Feedstuff	Cost per Cwt.	Therms N.E. Supplied per 100#	Cost per Therm of Net Energy (cents)
Rolled Barley	$2.75	80 Therms	3.44¢
Cottonseed Meal 41%	3.05	71.7	4.25
Alfalfa Hay	1.25	40.6	3.08
Corn Silage	.50	15.8	3.16
Hydro-grass	1.57*	8.45**	18.58

Note: * The cost of 100 pounds of Hydro-grass was arrived at by the use of the $7.50 daily production cost of the rated 1000# unit and the average output of 13% dry matter material from 100 pounds of seed barley in all three units.

** - This is an estimated net energy value for Hydro-grass based upon its laboratory analysis comparison with known feedstuffs.