HYDROPONIC FODDER

The Fodder Solution for Small Holder Dairy Farmers

FROM SEEDING TO HARVEST IN JUST NINE DAYS

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SAVE UP TO 50 PERCENT ON ANIMAL FEEDS WHILE INCREASING YIELD BY 20 PERCENT AND USE 70 PERCENT LESS WATER

Hydroponic farming is the art of growing plants without the use of soil. This technology is old as history and was used in famous hanging gardens of Babylon. For commercial purposes to feed livestock, it started in 1960s in Australia and has spread to the rest of the world ever since.

Hydroponics technology can be adopted using locally available materials to control temperature thereby making hydroponic farming a reality. A farmer can construct a 3m by 4m house unit which can support to feed two dairy cows or (10 pigs, goats, sheep) and over 400 birds. The amount of fodder from this unit is equivalent to two acres of Napier grass.

Hydroponic fodder for livestock is the main meal but not supplement. Actually it completely eliminates dairy meal, maize germ, pollard, poultry fed and even sow and weaner.

METHODS
1) USING INERT MEDIA

Here soil is replaced by inert media like river sand, coconut peak, rice husks, macadamia husks, or volcanic rocks.

The work of inert media is to support the plant upright since in hydroponic the fertilizer is mixed with irrigation water. Under this method, vegetables like spinach, sukumawiki, cabbages e.t.c, tubers like carrots, onions, potatoes etc legumes like beans and fruit like tomatoes and strawberries are grown.

2) USING WATER AS THE MEDIA

Here soil is replaced by water which has the nutrients. This method is used to grow hydroponic fodder for livestock and barley grass for human.

ADVANTAGES OF PLANTS GROWN HYDROPONICALLY
1) Fast growth and early maturity; this is because the seed does not use a lot of energy and time to break the soil.
2) Increase in yield; plants do not invest too much on root system and the extra energy is used to increase the yield.
3) Elimination of soil-borne diseases like bacterial wilts and nematodes
4) Increase in harvesting period.
5) Minimal use of fertilizer, water and space
HYDROPONIC FODDER FOR LIVESTOCK (COWS, SHEEP, GOAT, PIGS, CHICKEN) (broilers, layers, kenbro, dorep, quail, kuroilers E.T.C)

REQUIREMENTS

1) HOUSING: the structure should have a temperature range of between 17-25°C. This is because below 17°C there may be slow growth and above 25°C barley may start fermenting.

ii) SEED: Barley/Gadam sorghum is the best to sprout because of its nutrients and energy, other seeds like wheat, sorghum, millet, maize etc can also be sprouted.

iii) WATER: water should be clean and free from impurities.

iv) SUPPORT SURFACE; Treated aluminum trays are the best but they are costly. 200nm u.v treated polythene can also be used but they require washing with chlorine after every harvest.

v) FERTILIZER; due to early harvesting period of fodder for livestock e.g. 4 days for the poultry, fertilizer (nutrient) is not recommended. Some farmers use it to increase weight of the fodder but its safety to animals is not scientifically documented.

DAILY FEEDING PROGRAMME FOR COWS

DAIRY COW
45kg fodder +3 kg dry matter (hay, maize, stoker, dried grass, dry Napier e.t.c)+150g calcium salt.

ADVANTAGES

1) Increase in milk output from 10 percent.
2) Increase in fertility-one calf per year is assured.
3) Milk natural taste, color and smell are enhanced.
4) General immunity of the animal is boosted.
5) A saving of between 100 Ksh and 200 Ksh daily per cow is guaranteed.

To grow fodder for two dairy cows per month will require 3.5 litres of hydroponic nutrient solution. Giving hydroponic fodder as:
(a) Supplement- 2 kg barley seed per day per cow
(b) Main fodder- 6 kg barley seed per day per cow
So, to feed two dairy cows on hydroponic fodder as;

a) Supplement daily will require 4 Kg of barley seed/white Sorghum.
b) Main fodder daily will require 12 Kg of barley seed/white Sorghum.

To grow enough fodder for 2 cows as the main meal you require 360 Kgs of barley seed or white Sorghum (Gadam). 1 bag of barley seed is 80 Kg.

To grow enough fodder for 2 cows you need 42 aluminum trays. To control temperature, the shade net is used which is recommended for hydroponics. The table below summarizes the requirements to grow monthly enough fodder for 2 Dairy Cattle in 3m by 4m room:

<table>
<thead>
<tr>
<th>REQUIREMENTS</th>
<th>Hydroponics as main feed</th>
<th>Approximate Cost per unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barley/Gadam Sorghum seed</td>
<td>360 kg/month</td>
<td>45.00/Kg</td>
</tr>
<tr>
<td>Hydroponics nutrient solution</td>
<td>3.5 litres</td>
<td>1,500.00/litre</td>
</tr>
<tr>
<td>Aluminum Trays</td>
<td>42 trays</td>
<td>1000.00/tray</td>
</tr>
<tr>
<td>Hydroponics shade net</td>
<td>12square meters</td>
<td>135.00/meter</td>
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PIGS
Pigs can feed entirely on barley sprouts.

ADVANTAGES
i. Fat coat is reduced by 50 percent (FROM 14MM TO 7 MM.)
ii. They mature earlier by 2 weeks.
iii. Offensive smell associated with pigs is almost eliminated.
v. General immunity is improved.
v. Saving of between 2000 to 2500kshs per pig is evident.

FATTENING OF BULL AND DROUGHT STRICKEN COWS

15KG fodder +1.5kg maize meal +dry pasture
Young bulls (6 MONTHS OLD) are known to increase the weight by 108kg for three months under this feeding programme. This is because between six and nine months is bone spat period in cows. Emaciated cows recover in just one month.

POULTRY

LOCAL BREED
Aim to give 150g of fodder to any mature hen, Ducks, goose, pigeon, and quail eat according to their body weight.

EXOTIC
They take fodder 50 percent and 50 percent coconut cake or convectional feed.
ADVANTAGES

i) Early maturity; broilers are ready by 28th day and layers start laying at 16th week.

ii) The egg yolk is bright yellow in color,

iii) Cannibalism is eliminated.

iv) Save between 40 to 60 percent on feed.

HYDROPONIC FODDER PRODUCTION STRUCTURE AND GALLERY

To construct wooden shelves, you will need 500 pieces of timber 2 inches by 2 inches. The cost will depend on the availability of timber.

Alluminium trays arranged in a locally constructed unit. The trays are treated to discourage fungi and measure 40 by 110 cm

Self irrigating wooden unit
An ordinary room of 3m by 4m holds 42 trays.

Already sprouted barley seed on trays.

Mature hydroponic feed (Harvesting)
Chicken Feeding on Hydroponic Fodder

Ducks and Goats feasting on Hydroponic fodder