Meat Rabbits Finished on Sweet Potato Forage Looks Good in Texas Research

By S.D. Lukefahr, M.T. Garza, G.L. Schuster, and K.C. McCuistion

KINGSVILLE, Texas – A brief history lesson – during World War II, a record domestic rabbit population existed because much of the beef and other meat supplies were being rationed in order to feed our troops. Some of my older neighbors and relatives still remember their family’s “victory garden”. Some Americans also raised rabbits and integrated this activity with their victory gardens. The rabbits were fed garden “wastes” (such as husks, leaves, peelings, roots, and vines), kitchen scraps, and forage harvested from homegrown plots. Also, the rabbit manure was recycled as compost to return organic matter and vital nutrients back to the soil for next year’s crop.

For about the past two years, a rise in the demand for rabbit breeding stock has occurred. Many more American families today are also trying to stretch the food dollar and increase home earnings by starting their own garden. In terms of markets, SGF readers are well aware of the rapidly growing popularity of community supported agriculture groups and local farmers’ markets.

Rabbits lend themselves well to sustainable (even organic) production because they can consume inexpensive homegrown forage and garden wastes. Rabbits do not need vaccinations and most commercial diets do not contain antibiotics. In addition, the all-white and easily digestible meat is low in fat and cholesterol, based on published studies. Too, a quick Google search will show that there are thousands of tasty recipes for rabbit meat.

Raising rabbits can also be a fun and learning family activity. In Texas, the most popular, 1st year 4-H project (at 8 years of age) is a rabbit project. This is mostly because of the rabbit’s small size and gentle nature, and the low investment cost of the project.

SWEET POTATO PLANTS AS FORAGE
It is well known that the sweet potato is a major food crop in the world. It is a short-season crop, requiring 120-135 days to harvest. While the sweet potato is primarily grown for its tuber, the by-products (leaves and vines) are considered to be valuable agricultural by-products as forage for cattle, goats, pigs, and rabbits. Sweet potato leaves are high in protein (ranging from 25-30%), similar to that of temperate legumes. Rabbits only require 16% protein in their diet for normal growth and reproduction.

For three years, agriculture scientists and students at Texas A&M University-Kingsville have been conducting research trials that involve the feeding of sweet potato forage to growing rabbits. Forage plots were established in early April by planting slips about one foot apart - both between plants and rows (Photo 1). Plots were regularly irrigated and fertilized prior to harvest in mid-June. Typical of tropical conditions, daily outside minimum and maximum temperatures
ranged from 84 to 102 °F, and minimum and maximum relative humidity levels ranged from 90 to 100%.

About 60 days after planting slips from the commercial Centennial variety, plots were ready for hand-harvesting, which involved cutting at the half of each vine from the tip. Rows of plants were harvested in one-week intervals. The harvested forage (leaves with vines) was either sun dried for 24 hours (wilted group) or sun-dried for 3-4 days to make hay (hay group).

One challenge in the study was the fact that freshly harvested sweet potato forage contains about 90% water! Dry it for 24 hours in open sunlight and the value changes, albeit slightly, to 85% water. So, although the forage is highly nutritious, it requires some drying prior to feeding to effectively increase the nutritional value from protein, energy, minerals, and vitamins. Hay was made by after drying the forage for 3 to 4 days in open sunlight. However, the high air humidity made it difficult to remove most of the moisture. The sweet potato hay still contained about 52% water. Fortunately, the hay was fed on the following day, so there were no quality or mold issues concerning storage.

In 2011, during the feeding period (June 8 to July 5), the harvested forage was fed free-choice (unlimited supply) to growing rabbits. Forage-fed rabbits received 1.2 oz of crimped oats (per head per day) as an energy supplement. Trace-mineralized blocks were also made available to all forage-fed rabbits. In addition, another group of rabbits were only fed a commercial pelleted diet so that comparisons could be made. Sweet potato forage was fed in commercial aluminum feeders mounted to the front of the pen (Photo 2). Rabbits had access to water at all times.

A total of 45 crossbred rabbits were involved in the 28-day long experiment. Rabbits were randomly assigned to one of three diets to ensure no bias later in making diet comparisons. For each diet there were five cages, each containing 3 rabbits. The initial age of rabbits ranged from 54 to 56 days. Rabbits were weighed weekly and feed intake was measured daily. All rabbits were harvested at the end of the study so that carcass yield could be determined.

**RESULTS OF FEEDING EXPERIMENT**
Performance results for diets are found in Table 1. The first trait, initial body weight, shows very similar average values per rabbit, as expected. However, total weight gains of rabbits fed only pellets were higher than for rabbits fed forage, although the weight gains for the forage-fed groups are quite satisfactory considering the tropical environment. Likewise, final body weights were heavier, on average, for the pellets-fed group compared to the forage-fed groups.

For total feed intake, a total of 6.72 pounds of pellets was consumed over the 28-day study, being calculated on a per rabbit basis. Rabbits in the 24-hour wilted sweet potato group consumed a total of 22.0 pounds of forage, which again was about 85% water. Rabbits in the hay group consumed 9.27 pounds of forage, on average, per rabbit.

Although the pellets-fed group had somewhat heavier carcass weights than forage-fed rabbits, the dressing percentage (carcass yield based on live weights) values were similar. This was interesting because livestock that are fed high fiber diets typically have a lower dress-out weight because of the proportionately heavier visceral contents. These results could be explained by the high nutritional value of the sweet potato forage.
Table 1. Rabbit performances by diet in the sweet potato forage feeding study

<table>
<thead>
<tr>
<th>Trait</th>
<th>Pellets</th>
<th>Wilted Sweet Potato forage</th>
<th>Sweet Potato hay</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial body weight, lbs</td>
<td>3.31</td>
<td>3.35</td>
<td>3.36</td>
</tr>
<tr>
<td>Total weight gains, lbs</td>
<td>1.55</td>
<td>1.30</td>
<td>1.27</td>
</tr>
<tr>
<td>Final body weight, lbs</td>
<td>5.41</td>
<td>5.06</td>
<td>5.04</td>
</tr>
<tr>
<td>Total feed intake/rabbit, lbs</td>
<td>6.72</td>
<td>22.0</td>
<td>9.27</td>
</tr>
<tr>
<td>Carcass weight, lbs</td>
<td>3.48</td>
<td>3.25</td>
<td>3.15</td>
</tr>
<tr>
<td>Dressing percent</td>
<td>68.2</td>
<td>68.2</td>
<td>67.8</td>
</tr>
<tr>
<td>Market value, $</td>
<td>8.12</td>
<td>7.59</td>
<td>7.56</td>
</tr>
<tr>
<td>Profit margin, $</td>
<td>0.71</td>
<td>1.52</td>
<td>1.49</td>
</tr>
</tbody>
</table>

A market value for each diet was assigned based on average final body weight and the current market price of $1.25/lb for live rabbits at processing plants in the U.S. Despite the more rapid growth of rabbits fed pellets, it clearly came at a higher cost. Presently, the cost of commercial rabbit diets is well over $500/ton. Profit margins for forage-fed rabbits were similar and about $1.50 per rabbit, about double the return of pellets-fed rabbits. A small-scale, backyard rabbit operation of 20 breeding females should produce around 660 market fryers in one year. At present feed and market prices, the net feed savings would be about $525.

Besides generating income, the manure from rabbits also has value in terms of the compost used for the garden and plots. One holon activity, common in rabbitries in the South, is the production of redworms grown in manure beds or pits below the rabbit cages. Some rabbit producers earn even more income from the sales of worms as fishing bait than they do selling rabbits! Another money-making activity is for families to use the skins and tan them to make attractive products (dyed skins, foot charms, vests, etc.) that can be sold at local markets.

In selling the rabbit meat, perhaps the greatest opportunity for families is to develop niche markets, ideally at farmers’ markets. Consumers could be educated on the all-natural and nutritious, farm-raised rabbit meat. Of course, free meat samples and recipe flyers would help boost sales. However, sellers of rabbit meat should be aware of state meat inspection laws. Several states have no such laws for rabbit meat. Some states have set limits to the number of poultry (but likely not rabbits) that can be sold in a year that would be exempt of inspection. If such laws for rabbit meat do exist in a state, one strategy is that the buyer signs a simple form in which the live rabbit is purchased, but then the seller harvests the rabbit as a favor.

At Polyface Farms in Swoope, Virginia, “pastured rabbit” has been one of their enterprises for over 20 years. Rabbit fryers are processed on their farm and the meat is sold in their on-farm store. Because the volume is low (less than 20,000 in some states), no inspection is required. In Bastrop, Texas, Marjorie Wildcraft operates a small-scale rabbit enterprise that is closely integrated with her garden and other food-producing enterprises. The rabbit’s manure as compost is a real asset to their largely sustainable, organic farm that produces most of the food that her family consumes (backyardfoodproduction.com).
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CONCLUSIONS
Interested families can cultivate and harvest plots of sweet potatoes from their gardens to supply forage to rabbits in their small-scale enterprise. The functional integration concept is key by rabbits producing organic fertilizer for composting. Although sweet potato slips can be purchased from commercial suppliers, I recall that my maternal grandparents use to store tubers in the winter (by covering over in deep piles of straw) for planting in the spring, so slips were not purchased. In some cultures, farmers slice and dry “chips”, usually from surplus or non-marketable tubers which are fed to their livestock as a high energy feed. In conclusion, such a sustainable model involving on-farm resources can produce more food at less cost for families and potentially earn income from food sales at local markets.

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