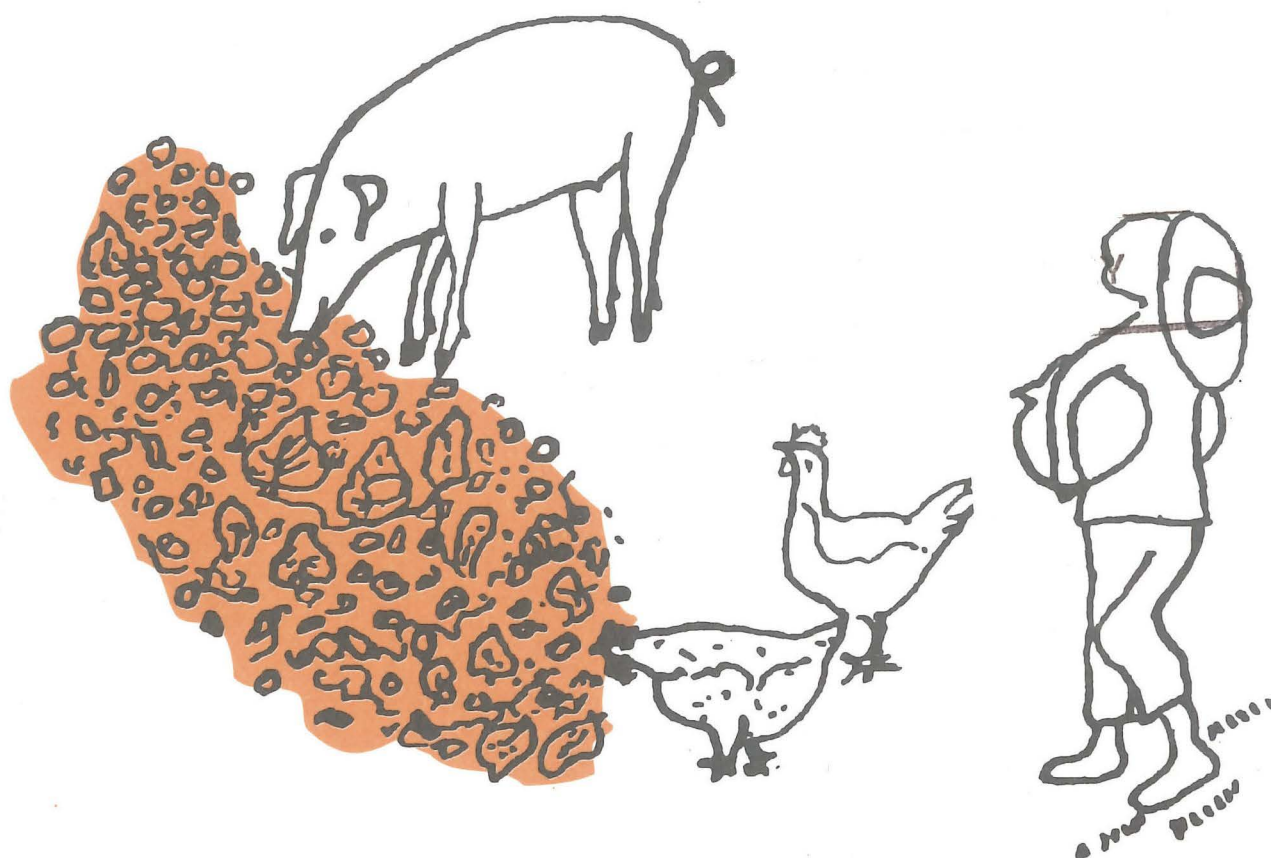


# use of cassava and sweet potatoes in animal feeding



Food  
and  
Agriculture  
Organization  
of  
the  
United  
Nations



## BETTER FARMING SERIES

The titles published in this series are designed as handbooks for intermediate-level agricultural education and training courses. They may be purchased as a set or individually.

1. The plant: the living plant; the root
2. The plant: the stem; the buds; the leaves
3. The plant: the flower
4. The soil: how the soil is made up
5. The soil: how to conserve the soil
6. The soil: how to improve the soil
7. Crop farming
8. Animal husbandry: feeding and care of animals
9. Animal husbandry: animal diseases; how animals reproduce
10. The farm business survey
11. Cattle breeding
12. Sheep and goat breeding
13. Keeping chickens
14. Farming with animal power
15. Cereals
16. Roots and tubers
17. Groundnuts
18. Bananas
19. Market gardening
20. Upland rice
21. Wet paddy or swamp rice
22. Cocoa
23. Coffee
24. The oil palm
25. The rubber tree
26. The modern farm business
27. Freshwater fish farming: how to begin
28. Water: where water comes from
29. Better freshwater fish farming: the pond
30. Better freshwater fish farming: the fish
31. Biogas: what it is; how it is made; how to use it
32. Biogas 2: building a better biogas unit
33. Farming snails 1: learning about snails; building a pen; food and shelter plants
34. Farming snails 2: choosing snails; care and harvesting; further improvement
35. Better freshwater fish farming: further improvement
36. Raising rabbits 1: learning about rabbits; building the pens; choosing rabbits
37. Raising rabbits 2: feeding rabbits; raising baby rabbits; further improvement
38. Better freshwater fish farming: raising fish in pens and cages
39. Raising ducks 1: how to begin
40. Raising ducks 2: further improvement; a larger flock
41. Raising ducks 3: further improvement; taking care of a larger flock
42. Using fodder from trees and shrubs to feed livestock in the tropics
43. Feeding animals on straw
44. Processing of cassava and sweet potatoes for animal feeding
45. Multinutrient block handbook
46. Use of cassava and sweet potatoes in animal feeding

# **use of cassava and sweet potatoes in animal feeding**

by V. Ravindran

Department of Animal Science  
Faculty of Agriculture  
University of Peradeniya  
Sri Lanka

The designations employed and the presentation of material in this publication do not imply the expression of any opinion whatsoever on the part of the Food and Agriculture Organization of the United Nations concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

David Lubin Memorial Library Cataloguing in Publication Data

Ravindran, V.

*Use of cassava and sweet potatoes in animal feeding.*

(FAO Better Farming Series, no. 46)

ISBN 92-5-103618-7

1. Cassava 2. Sweet potatoes 3. Animal feeding

I. Title II. Series III. FAO, Rome (Italy)

FAO code: 23 AGRIS: L02

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying or otherwise, without the prior permission of the copyright owner. Applications for such permission, with a statement of the purpose and extent of the reproduction, should be addressed to the Director, Publications Division, Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, 00100 Rome, Italy.

## PREFACE

---

The first 26 volumes in FAO's Better Farming Series were based on the **Cours d'apprentissage agricole** prepared in Côte d'Ivoire by the **Institut africain de développement économique et social** for use by extension workers. Later volumes, beginning with No. 27, have been prepared by FAO for use in agricultural development at the farm and family level. The approach has deliberately been a general one, the intention being to create a basic model that can be modified or expanded according to local conditions of agriculture.

Many of the booklets deal with specific crops and techniques, while others are intended to give farmers more general information that can help them to understand why they do what they do, so that they will be able to do better.

Adaptations of the series, or individual volumes in it, have been published in Amharic, Arabic, Armenian, Bengali, Creole, Ewe, Gipepe, Hindi, Igala, Indonesian, Kiswahili, Malagasy, Malaysian, Nepali, Oriya, SiSwati, Thai, Tschiluba, Urdu and Vietnamese.

Requests for permission to issue this booklet in other languages and to adapt it according to local climate and ecological conditions are welcomed. They should be addressed to the Director, Publications Division, Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, 00100 Rome, Italy.

# OUTLINE OF THE BOOKLET

---

<b>INTRODUCTION</b>	<b>1</b>
<b>CASSAVA ROOTS AS AN ANIMAL FEED</b>	<b>2</b>
Use of cassava roots in pig feeding	3
Use of cassava roots in chicken feeding	13
Use of cassava roots in rabbit feeding	17
Use of cassava roots in ruminant feeding	18
<b>CASSAVA PEELS AS AN ANIMAL FEED</b>	<b>21</b>
<b>CASSAVA LEAVES AS AN ANIMAL FEED</b>	<b>24</b>
Production of cassava leaves	25
Feed value of cassava leaves	27
Use of cassava leaves in chicken feeding	30
Use of cassava leaf meal in pig feeding	32
Use of cassava forage in ruminant feeding	33
Use of cassava forage silage	35
<b>SWEET POTATOES AS AN ANIMAL FEED</b>	<b>37</b>
Use of sweet potatoes in pig feeding	37
Use of sweet potatoes in rabbit feeding	41
Use of sweet potatoes in chicken feeding	42
Use of sweet potatoes in ruminant feeding	43
<b>SWEET POTATO VINES AS AN ANIMAL FEED</b>	<b>44</b>
Use of vines in pig feeding	44
Use of vines in rabbit feeding	45
Use of vines in chicken feeding	46
Use of vines in ruminant feeding	46

# INTRODUCTION

---

1. You learned in Booklet No. 44 that cassava roots and sweet potato tubers are good energy sources for animal feeding.
2. You also learned how to process cassava and sweet potato into dried chips and silage.
3. In this booklet, you shall learn how to use processed cassava and sweet potato in the feeding of various farm animals.

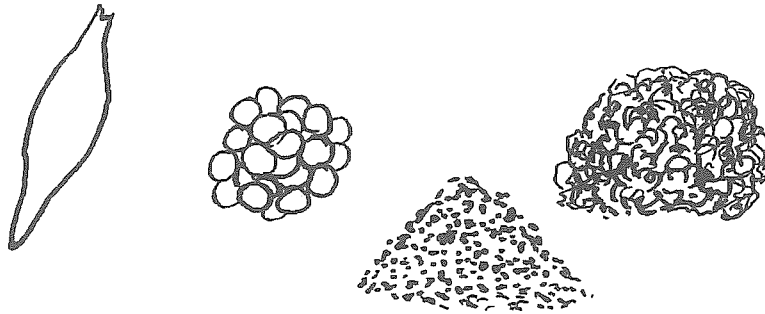


4. Cassava tops and sweet potato vines remaining after root harvest are also valuable feeds.
5. In this booklet, you will learn how to use these in animal feeding.

## CASSAVA ROOTS AS AN ANIMAL FEED

6. Cassava roots can be fed to animals in many forms including:

- as fresh roots;
- as dried chips;
- as a meal;
- as silage.



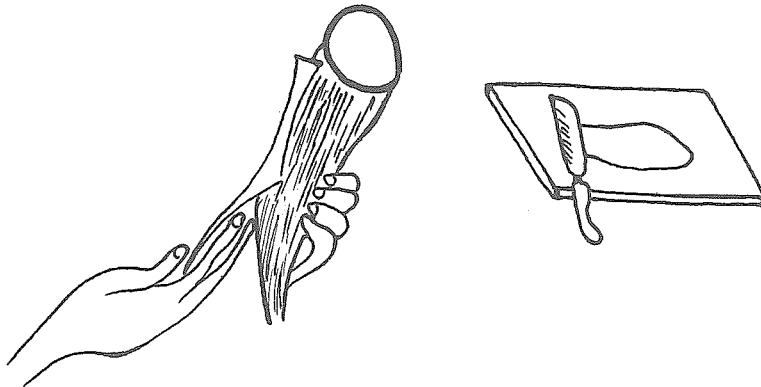
7. In the next few sections, we will learn **separately** how we can use cassava in the feeding of pigs, chickens, rabbits and cattle.



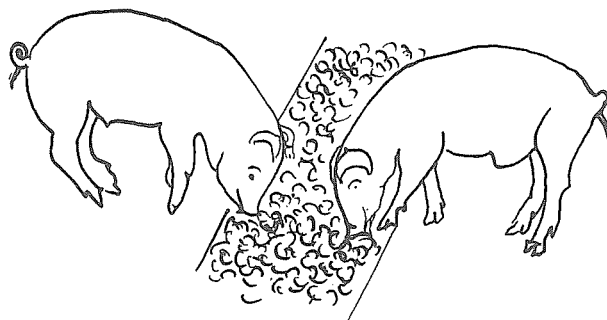
## USE OF CASSAVA ROOTS IN PIG FEEDING

### Feeding of fresh roots

8. The easiest way to feed cassava is in the fresh form. Whole roots can be peeled, chopped and given **free choice** to pigs.



9. You can let the animals eat as much as they like. But you must be careful since cyanide can cause problems.
10. Pigs will not readily eat fresh roots of bitter cassava because of the cyanide. They will not grow well. They may even get sick.
11. **If you want to use bitter cassava, you must boil it.** However, boiling will require wood or fuel and it is costly.
12. The safe way is to introduce the fresh roots slowly and watch the pigs carefully.

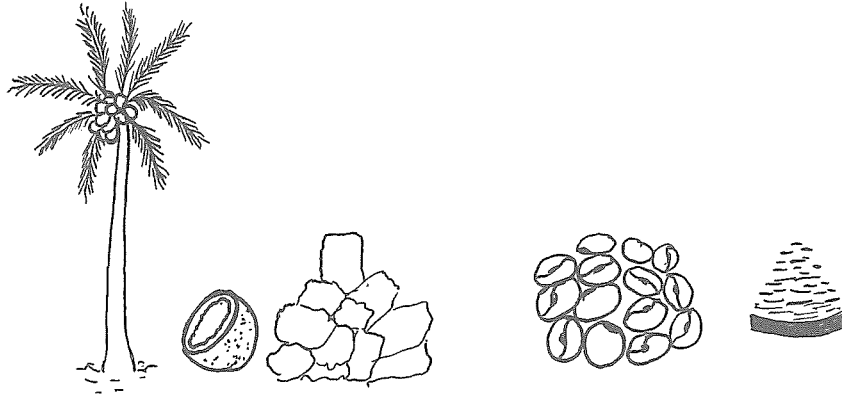


13. If you don't see any bad signs, that means there is no cyanide problem. Then **slowly** increase the amount given.
14. When you introduce fresh roots, if you notice anything wrong with the animals and you don't understand why, stop feeding the fresh roots.
15. The bigger the pigs are, the more cassava roots they can be given. For two- to four-month old pigs, you can feed 1-1.5 kg of fresh roots every day. For older pigs, you can feed 3-6 kg of roots daily.

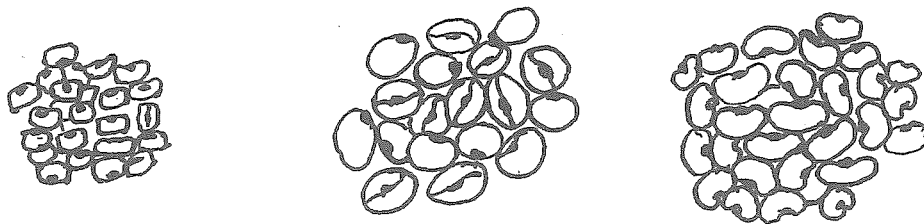
#### **Need for supplements**

16. Remember cassava root is an energy feed. It **cannot** be used as the **sole feed** to pigs.
17. You have learned that cassava is low in protein, minerals and vitamins. These nutrients must be given in the form of **supplements** when you feed cassava
18. There are many feeds that can supply protein to pigs. These include:
  - **oilcakes;**
  - **grain legumes (or pulses);**
  - **meat meal;**
  - **fish meal;**
  - **dried leaf meals.**
19. Oilcakes are the commonly used protein feeds in animal feeding. You can find many types of oilcakes in your area.

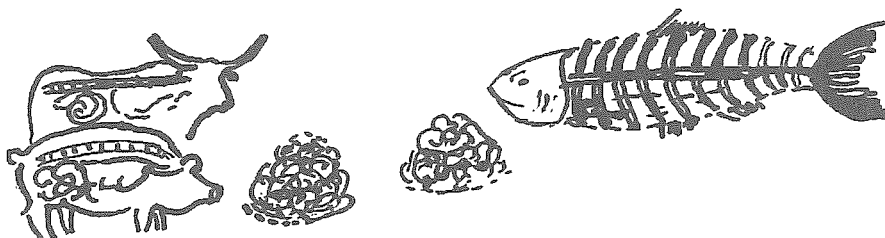
20. Soybean meal, cottonseed meal, groundnut meal, coconut meal and palmkernel meal are some examples of oilcakes. Soybean meal is a very good protein feed, but is expensive.



21. Grain legumes such as cowpea and mung beans are important protein foods for humans. Usually these are too costly to use as animal feeds; but if the price is low, you can use them as well.

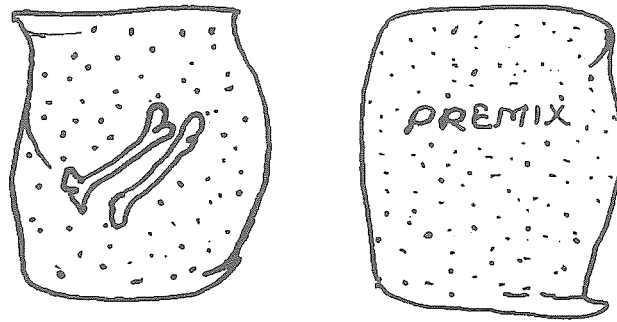


22. Animal protein feeds are better sources of protein than plant protein feeds. Fish meal and meat meal are examples of animal protein feeds.

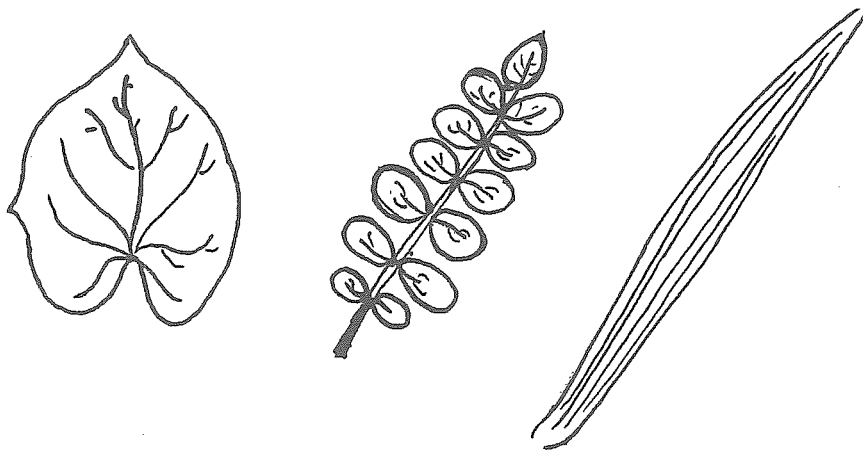


23. Minerals and vitamins are needed only in small amounts. Calcium and phosphorus can be given as bone meal or dicalcium phosphate. Other minerals

and vitamins can be given as **premix**. Premix can be purchased from feed dealers.



24. You can also supply the vitamins and minerals by giving leaves, grass and other fresh materials to pigs.



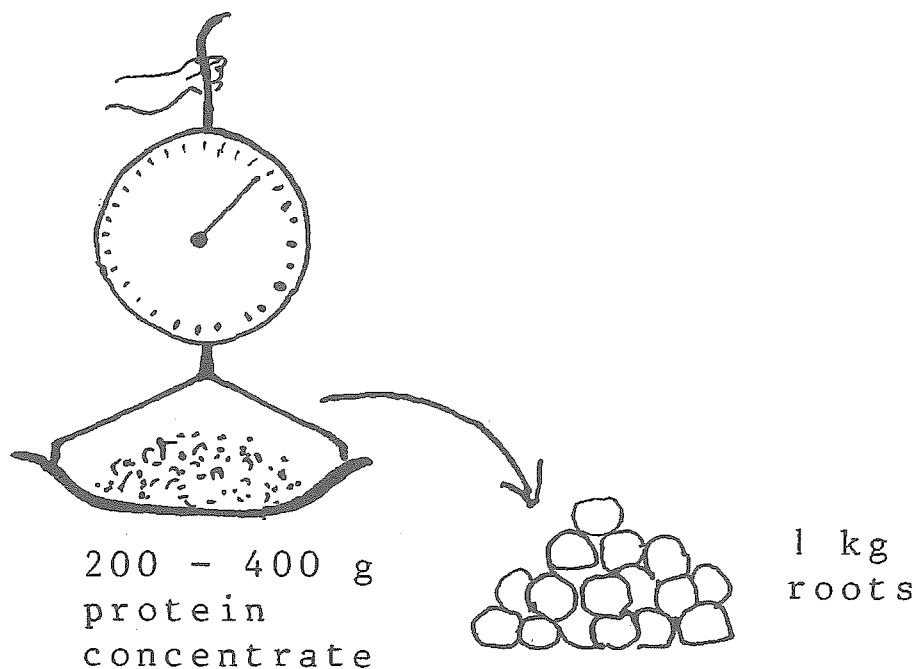
25. The vitamins and mineral supplements must be mixed with the protein feeds and the mixture must be fed along with cassava roots. This mixture is called **protein concentrate**.

#### The protein concentrate

26. A 10-kg mixture of protein concentrate could be prepared using the following ingredients:
- 4-5 kg of oilcakes;
  - 3-5 kg of fish meal, meat meal or soybean meal;

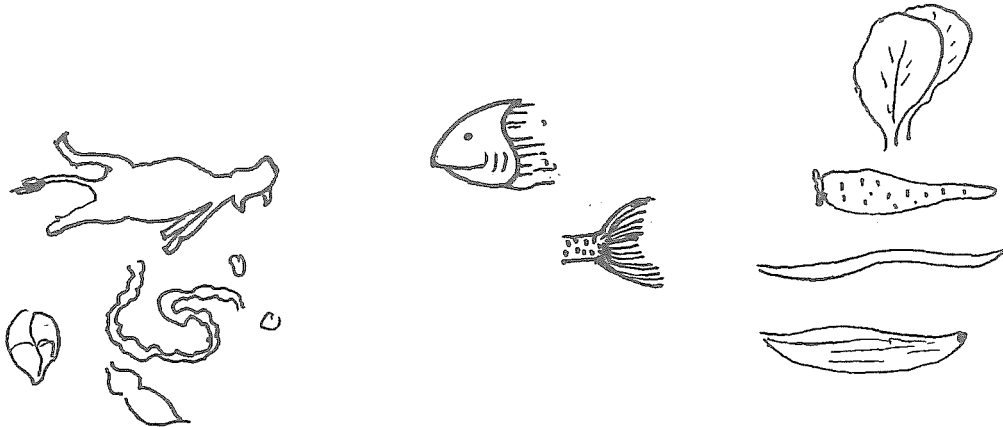
- 80-100 g of bone meal;
- 20 g of salt;
- 20 g of mineral and vitamin premix;
- 20 g of methionine (if available).

27. To get good results, you must give 200-400 g of protein concentrate for every kilogram of cassava roots that you are feeding.



28. You must mix the protein concentrate well with the fresh roots and then feed the pigs. Do not feed the roots and the protein concentrate separately.
29. Sometimes you may find that feeding protein concentrate is not economical, especially when you are getting low prices for your pigs.
30. At times like this, you can feed cassava along with various wastes available in your area, such as fish

wastes, slaughterhouse wastes, vegetable wastes, leaves and grasses.



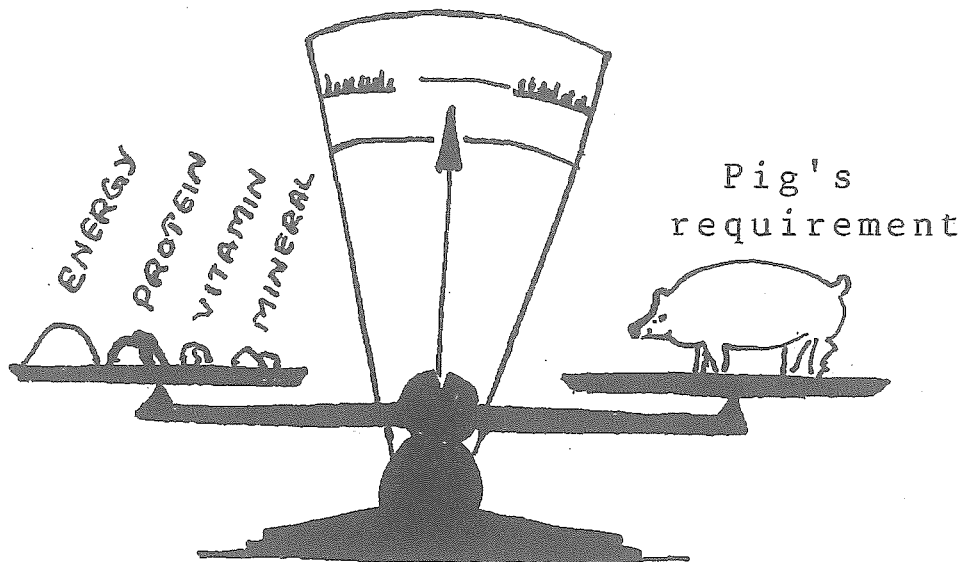
31. Pigs will not grow fast on this type of feeding, but this method is cheaper.

#### **Feeding of dried chips to pigs**

32. You can use dried cassava chips to feed pigs, just as you would feed the fresh roots. You must mix the chips with a protein concentrate and feed.
33. Pigs will eat the dried chips without any problem. However, they will like them more if they are moistened before use.
34. A convenient way of using the dried chips is to grind them into a meal and use for feeding.

#### **Use of cassava meal for pig feeding**

35. Cassava meal can be included into **compounded rations** and can be fed to pigs.
36. Compounded rations are complete feeds and are **balanced** to supply all necessary nutrients.

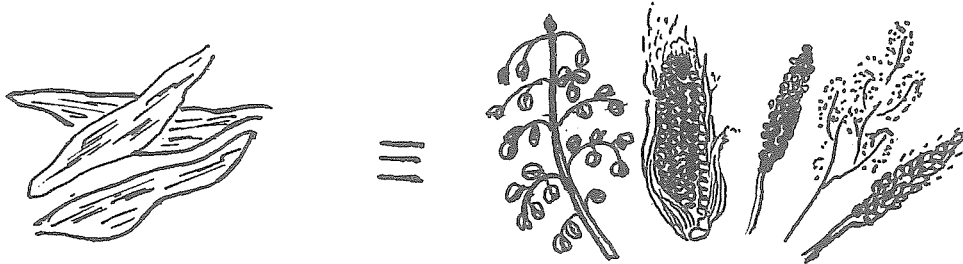


37. Compounded rations are prepared by mixing together energy feeds, protein feeds and mineral and vitamin supplements in correct amounts.
38. The mash-type feeds that you buy from the dealer are prepared like this. You can mix this type of ration on your farm as well.



39. In compounded rations, cereal grains are used as energy feeds. You can use cassava meal instead of cereal grains.

40. Cassava meal gives the pigs the same amount of energy as cereal grains.



41. **How much cassava meal can you use?** The amount of cassava meal that you can put into compounded rations will vary according to the size of the pigs.
42. As the pigs grow bigger, you can use more cassava meal.
43. For growing pigs (two to four months of age), you can use up to 60 percent of the ration. If you are mixing a 10-kg ration, up to 6 kg of it can be cassava meal.
44. For finishing pigs (four to six months of age) and older animals, you can increase the use of cassava meal up to 70 percent. In a 10-kg ration, up to 7 kg can be cassava meal.
45. When you are using cassava meal in your rations, you must use good protein feeds. You must use fish meal, meat meal or soybean meal.
46. For you to understand the principle of compounded rations, some **examples** of pig rations using cassava meal follow.



## Pig rations using cassava meal

Ingredient	Ration for	
	growing pigs	finisher pigs
	Parts	
Cassava meal	60	70
Maize	10	6
Soybean meal	22	16
Fish meal	6	6
Bone meal	1	1
Vitamin-mineral premix	0.5	0.5
Common salt	0.3	0.3
Methionine	0.2	0.2
<b>Total</b>	<b>100</b>	<b>100</b>

47. If you want to mix your own pig ration in your farm using cassava meal as the energy feed and if you need help ask your extension agent.



48. The agent can help you to formulate a properly balanced ration using feedstuffs available in your area.
49. When you use high levels of cassava meal in ration, the ration becomes powdery.
50. If you find a pig ration powdery, you can overcome the problem by mixing with water and practising **wet feeding**.
51. When you wet the ration, use one bucket of water to wet one bucket of ration. Pigs like wet feed and will eat enough of the ration.



### **Feeding of cassava root silage to pigs**

52. Cassava root silage is a good pig feed. It has low levels of cyanide. When you make silage, the cyanide level is reduced.

53. When you first introduce the silage, pigs may not like it. They may not eat much. After a few days, they will get used to the silage.
54. You may see watery faeces when you feed root silage. You need not worry about it because all silages have a slightly laxative effect.
55. Cassava root silage can be used just like fresh roots to feed pigs. Give the pigs as much as they want to eat.
56. Make sure that you feed the silage with a protein concentrate.
57. You can use the silage to feed pigs of all age groups, except for very young pigs.

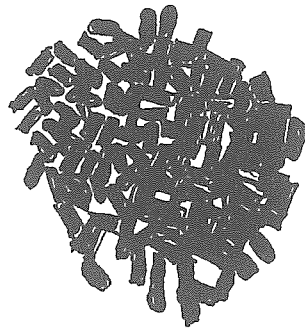
#### **USE OF CASSAVA ROOTS IN CHICKEN FEEDING**

58. Feeding chickens is different from feeding pigs. For pigs, you can give the feed as mash, dried materials or fresh materials. For chickens, you need to give all their feed **in mash form only**.
59. Just like pig feeding, cassava meal must be mixed with other feeds in compounded rations and fed in mash form.
60. The energy value of cassava meal for chickens is similar to those of cereal grains.
61. **How much cassava meal can be used?** The maximum amount of cassava meal that can be used varies for different types of chickens.



62. **For young chickens and for broilers, you must not use more than 20 percent cassava meal in rations. If you are mixing a 10-kg ration, cassava meal must not make up more than 2 kg.**
63. **In the rations of growing chickens, you can include up to 30 percent cassava meal. You can use up to 3 kg of cassava meal in mixing a 10-kg ration.**
64. **For chickens that are laying eggs, you can include up to 40 percent cassava meal. When you mix a 10-kg ration, up to 4 kg can be cassava meal.**
65. **Too much cassava meal must be avoided. If you use too much cassava meal, the ration will become powdery and dusty.**
66. **Powdery rations can cause problems. You can get irritated by the dust. Birds can also be irritated by dust. Finally they will not eat enough.**

67. **How can you overcome the dustiness?** There are several ways by which dustiness can be overcome:
- by pelleting;
  - by the addition of molasses or fat;
  - by wet mash feeding.
68. **Using pellets** effectively overcomes the dustiness and powdery texture. However, you cannot do this on your farm because you need a pelleting machine.

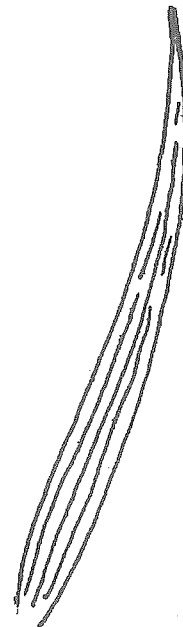
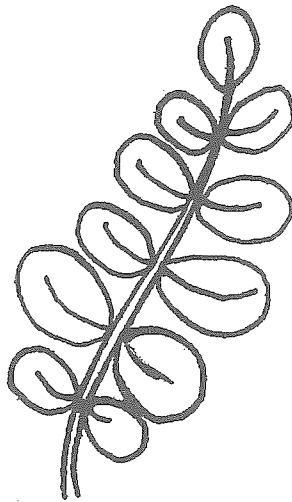
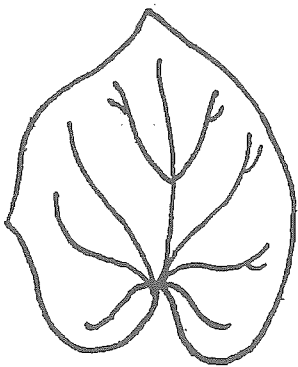


69. You can also overcome the dustiness by **adding molasses or fat**, if these are available and cheap in your area.
70. **Wet mash feeding** can be used to avoid the dustiness problem. Wet mash feeding is also very useful during hot weather.
71. You have to wet the feed daily and feed it to chickens. Otherwise the feed will get spoiled.

#### **Low level of pigments in cassava**

72. Cassava meal is white in colour. It does not have any pigments. When you feed rations with a lot of cassava, the egg yolks will be light-coloured and the chicken meat will have pale skin. These egg and this chicken meat will get only a low price.

73. You can avoid this problem by using feeds that have a lot of pigments. Leaves have a lot of pigments. You can use **dried leaf meals in your ration to supply the pigments.**
74. When you use high levels of cassava meal, make sure to include a leaf meal in the chicken ration.
75. At least 300-500 g of leaf meal must be used when mixing a 10-kg chicken ration.
76. You can prepare leaf meals from many plants that are available around your farm. Some examples are:
- cassava leaves;
  - sweet potato leaves;
  - *ipil-ipil* leaves;
  - young grass.



77. If you are interested in mixing chicken rations on your farm, the examples that follow may be useful. The formulations are given for mixing of a 100-kg ration.

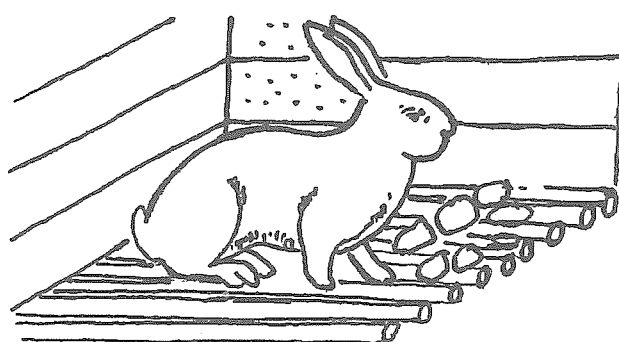
## Chicken rations using cassava meal

Ingredient	Ration for		
	chicks	growing chickens	laying chickens
		Parts	
Cassava meal	20	30	40
Maize	37	40	20
Soybean meal	30	15	20
Fish meal	8	6	6
Cassava leaf meal	3	6	6
Bone meal	1	2	1
Oyster shell	0	0	6
Vitamin-mineral premix	0.5	0.5	0.5
Salt	0.3	0.3	0.3
Methionine	0.2	0.2	0.2
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>

78. These ingredients are given as useful examples. The feeds that are commonly available in your area may be different. You can modify the formulation according to what feeds are available to you.

## USE OF CASSAVA ROOTS IN RABBIT FEEDING

79. You can feed fresh cassava roots to rabbits. They like to nibble and eat them.

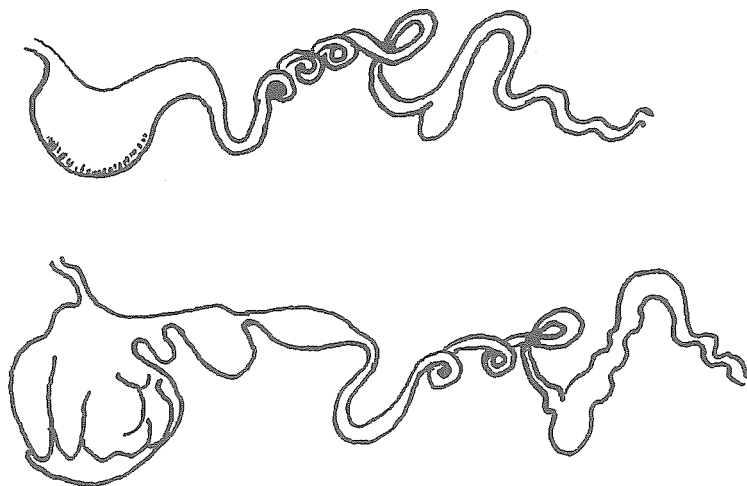


80. When you are giving fresh roots, remove the peel, cut the roots into sections and then feed the root pieces.

81. You can also feed the cassava as dried chips or as meal. You can use up to 40 percent cassava meal in rabbit rations.

## USE OF CASSAVA ROOTS IN RUMINANT FEEDING

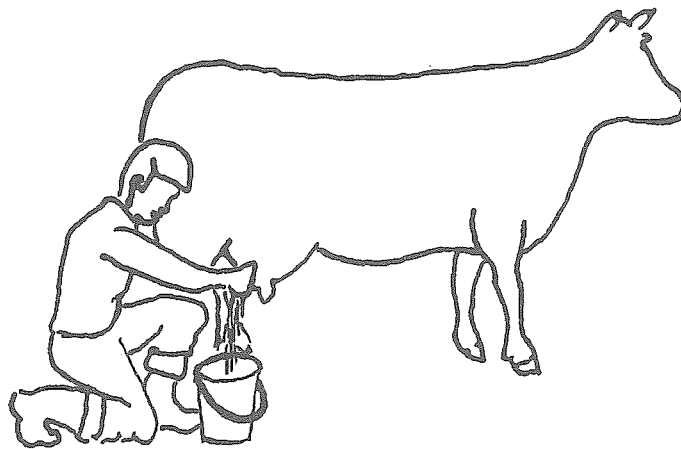
82. Pigs and chickens have simple stomachs. Cattle have **complex stomachs**. Goats, sheep, buffaloes and camels also have complex stomachs.
83. Animals with complex stomachs are called **ruminants** because they ruminate (Booklet No. 12, page 11).



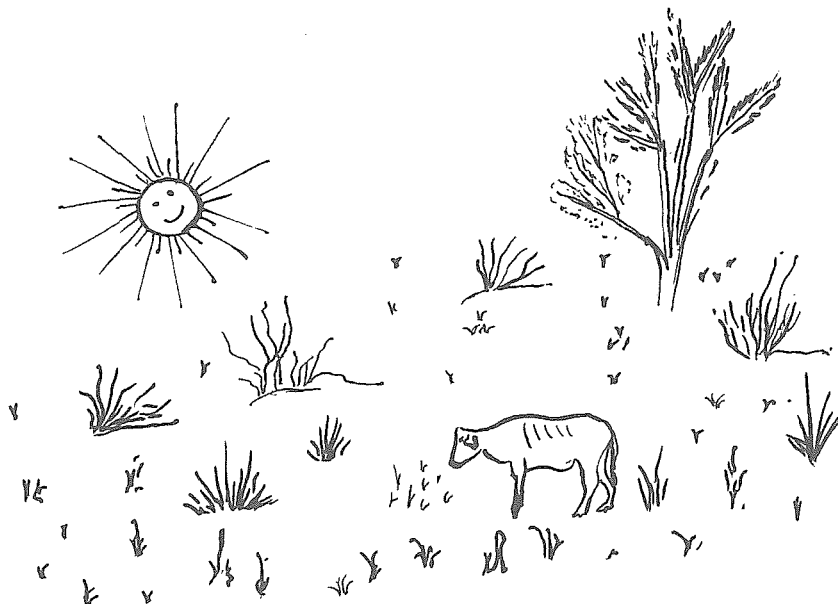
84. Ruminants eat feeds that are different from the feeds eaten by pigs and chickens. They can eat and digest feeds that are fibrous. These feeds are called roughages.
85. Grasses, legumes and tree leaves are all roughages. These are good roughages. Straws remaining after harvesting crops are also roughages; but these are poor-quality roughages.
86. Ruminants can be reared on good-quality roughages alone. These will give the nutrients to maintain the body and to grow.



87. There may be situations where you have to give supplementary feeds, such as cassava roots, for good growth of animals.
88. When the animals are raised for meat, you cannot make them grow fast on roughages alone. You can give cassava roots as supplementary feeds.
89. In milking animals, you are likely to get more milk from them. You can feed cassava roots to these animals, in addition to the roughages.



90. In the dry season, there may not be enough grass for the animals to eat. Animals will then lose weight and become thin. Cassava can be useful.

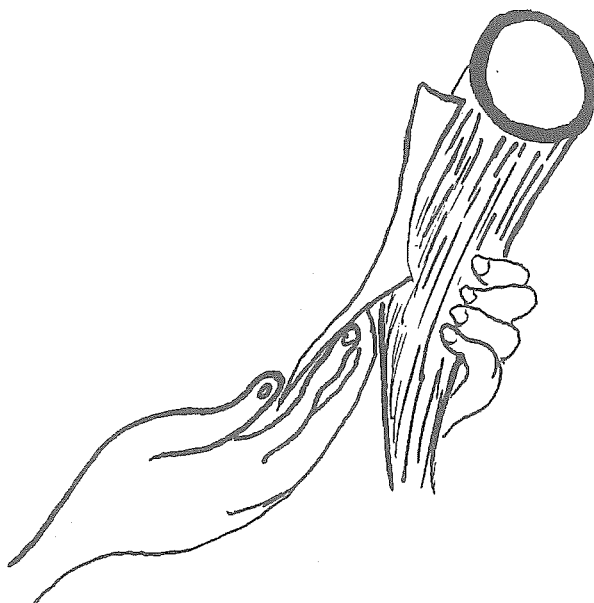


91. You can feed cassava roots to ruminants in several forms:
- as chopped fresh roots;
  - as dried chips;
  - as silage;
  - as cassava meal.
92. You need not worry much about the cyanide problem when you feed cassava to ruminants. They can tolerate high levels of cyanide.
93. Silage is the best way to preserve cassava roots for ruminants. When you are making root silage for ruminants you can add chopped cassava foliage to the silage.
94. Adding foliage will increase the protein content of the silage. This silage is a balanced feed for ruminants. Animals readily eat this silage.

## CASSAVA PEELS AS AN ANIMAL FEED

---

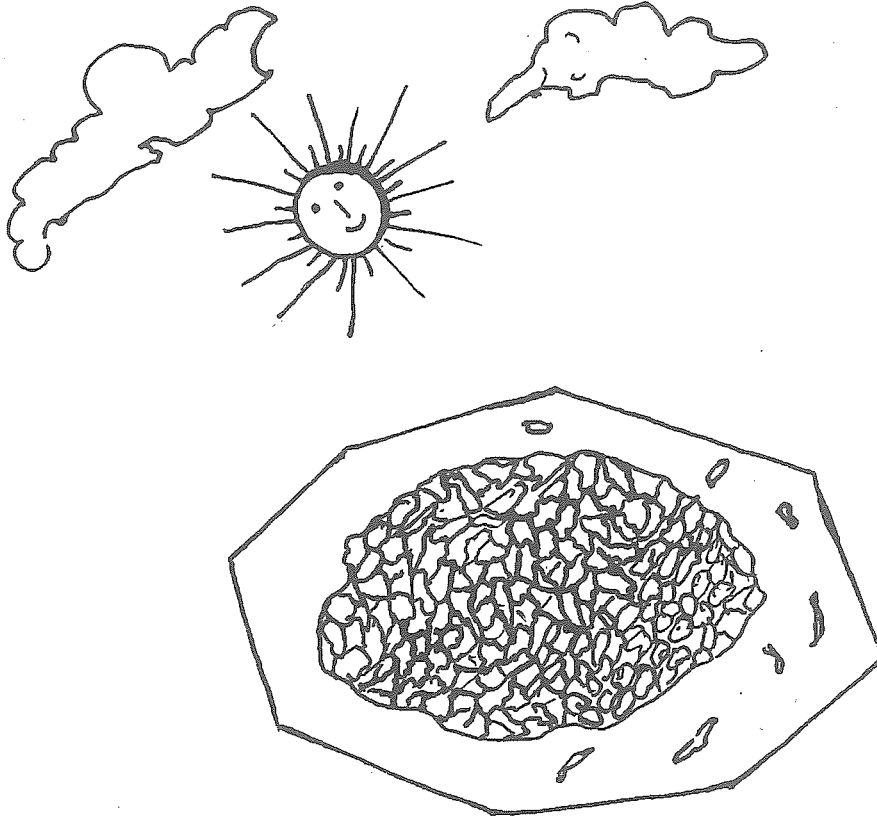
95. During cassava processing a lot of cassava peels become available. These may be used for feeding animals.



96. When you process 100 kg of cassava roots, 10-15 kg of cassava peel becomes available as a by-product.
97. Cassava peel looks fibrous. You must know that it can supply many nutrients.
98. If you take 100 kg of cassava peel, it will contain about:
- 6 kg of protein;
  - 4 kg of fat;
  - 6 kg of minerals.
99. You must limit the amount of cassava peel fed to pigs and chickens because it also has a lot of fibre.
100. Fresh cassava peels have high levels of cyanide –

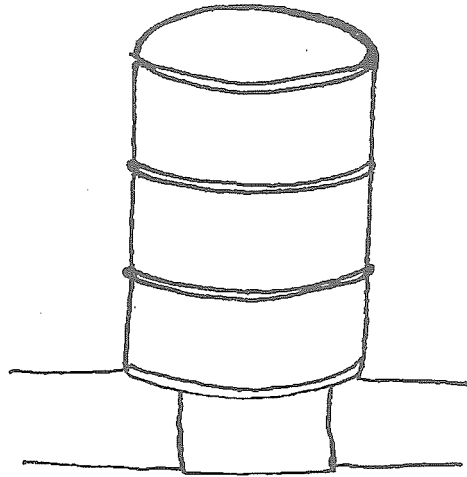
much higher than the level present in the flesh of the roots.

101. Fortunately, you can reduce the cyanide in the peels by simply drying in the sun.



102. For ruminant animals, peels are good energy feeds. They can be safely used.
103. You can also use the peels to feed pigs and chickens, but you must combine them with other feeds. Do not use more than 2 kg cassava-peel meal in a 10-kg ration.
104. **You can also make a peel silage.** You can make a silage using cassava peels, in the same way that cassava root silage is made.

105. You can use a small silo such as an oil drum. Line the oil drum with polyethelene sheets. Make holes at the bottom to drain the liquid coming out of the silage. Keep the drums on stones or on a concrete floor for easy drainage.



106. You must first wilt the peels in the sun for a day to reduce the water content. Then pack the wilted peels in the drum and press them tight.
107. You must then cover the top of the drum. You can use banana leaves, grass or polyethelene sheets to cover. Then put some stones on the top.
108. Cassava peel silage will be ready in four weeks. It can be used for feeding of ruminants and pigs. Cyanide levels are far lower in the peel silage.

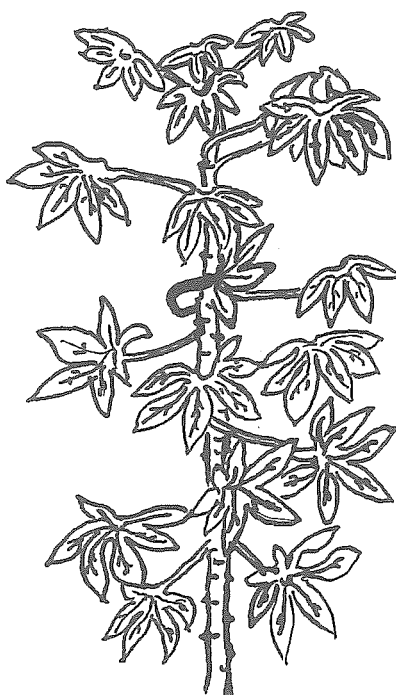
## CASSAVA LEAVES AS AN ANIMAL FEED

109. Did you know that cassava leaves can be used as an animal feed? If you did not, read this section carefully.

You will learn about:

- the feed value of cassava leaves;
- how they can be processed;
- how they can be used in animal feeding.

110. Cassava leaves can supply many nutrients that are necessary for animals. They are a good protein feed.



111. For ruminant animals, you can feed both the leaves and the tender stems. This is called cassava forage.

112. For pig and chicken feeding, you must strip the leaves, dry them and grind them into a meal. The milled product is called **cassava leaf meal**. By drying 100 kg of

fresh cassava leaves, you can prepare about 20-25 kg of meal.

## **PRODUCTION OF CASSAVA LEAVES**

113. The amount of leaves that you can get will vary depending on the cultivar that you have planted. Some cultivars have more branches and produce more leaves than others.
114. The amount of leaves that you can harvest from a plant also varies, depending on:
- the age of plant;
  - the climate in your area;
  - soil fertility.
115. You can produce leaves in three ways. We will look at each of these possibilities.

### **Growing for roots**

116. Farmers grow cassava mainly to harvest the roots. When you harvest the roots, you can save the leaves to feed animals.
117. You will not get many leaves when you collect them at root harvest. The leaf yields will be low.

### **Growing for roots and leaves**

118. You can also harvest the leaves while the cassava plant is growing and while the roots are being formed.



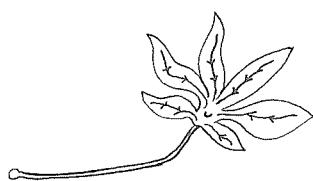


## Growing for leaves only

124. You can also plant cassava for the sole purpose of harvesting leaves.
125. In parts of **Brazil**, farmers plant cassava to produce leaves only. Leaves are harvested, dried, ground into a meal and sold for mixing in compounded rations.
126. When you plant cassava for leaf production only, you can plant it with closer spacing. You can have about 60 000 plants to the hectare.
127. This is much closer planting than that used for root production. For root production, you plant only 10 000 plants to the hectare.
128. You can start the first leaf harvest four months after planting and then harvest at three-month intervals.
129. In **Venezuela**, with this type of cultivation practice, leaf dry-matter yields of over 21 000 kg to the hectare have been obtained. This is a high yield for any forage material.

## FEED VALUE OF CASSAVA LEAVES

130. Cassava leaves are a **good protein feed**. Even mature cassava leaves contain a lot of protein. Dried mature cassava leaves can give about 200 g of protein to the kilogram.



131. Let us see the amount of protein that is supplied by 1 kg of alfalfa meal and different oilcakes. Alfalfa is a legume that is widely used in animal feeding in cold climates.
132. You can see that mature cassava leaves have similar amounts of protein to coconut meal and palmkernel meal.

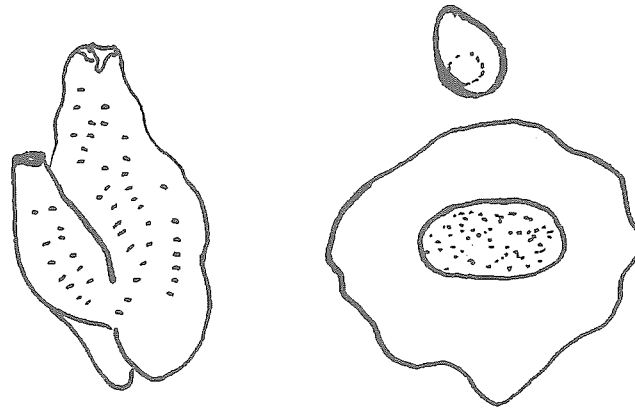
Alfalfa meal	200 g
Soybean meal	400 g
Groundnut meal	350 g
Cottonseed meal	350 g
Coconut meal	250 g
Palmkernel meal	210 g

133. Young cassava leaves have even higher levels of protein. They can give 280-300 g of protein to the kilogram of dried leaves.
134. Cassava leaves are also a rich source of **minerals and vitamins**.
135. We know that all leaves are fibrous. Cassava leaves have a lot of fibre.
136. This fibre level does not cause any problems to ruminants. Ruminant animals can digest and use the fibre for energy. Cassava leaves are good feeds for ruminants.
137. For pigs and chickens, this high fibre level can cause problems. This means that cassava leaves must be used within limits in pig and chicken feeding.

138. Cassava leaves are rich in **pigments**. This is useful in chicken feeding.
139. As with cassava roots, cassava leaves contain cyanide. In fact, fresh cassava leaves have more cyanide than the roots.
140. By simple drying of the leaves in the sun, you can eliminate most of the cyanide present in cassava leaves.
141. **You have to chop and wilt the leaves before drying in the sun.**
142. While wilting, you must regularly turn the leaves over. Otherwise fermentation may occur and spoilage may start.
143. After wilting, the chopped leaves must be uniformly spread over a drying area. They will dry quickly.
144. Once well dried, they can be collected and ground into a meal. Meal can be stored in bags or gunny sacks.
145. Dried cassava leaves and cassava leaf meal have excellent storage qualities. Insects and moulds will not attack them. They can be kept in dry places for over a year and used when necessary.

## USE OF CASSAVA LEAVES IN CHICKEN FEEDING

146. The chicken mash which you purchase from dealers usually has a leaf meal in it to supply the pigments and to improve the colour of egg yolk and colour of skin of meat birds. In a 10-kg mash, 300-500 g of leaf meal is usually included.



147. In North America and Europe, alfalfa meal is the popular leaf meal used in chicken feeds. It is also known as lucerne meal.



148. In warm climates, cassava leaf meal can be used for this purpose. The feed value of cassava leaf meal for chickens is equal to that of alfalfa meal.
149. In some tropical countries, *Leucaena* leaf meal is used to supply the pigments in chicken rations. *Leucaena* is a tree legume. It is also called *ipil-ipil*.



150. Cassava leaf meal has a better feed value than *Leucaena* leaf meal.
151. For the best results, you must use about 3 to 5 percent cassava leaf meal in your rations.
152. You have learned earlier (in Paragraph No. 77) about

some examples of chicken rations with cassava leaf meal.

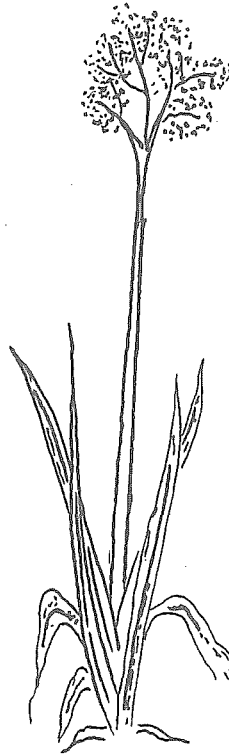
153. You have also learned earlier (in Paragraph No. 131) that cassava leaf meal has a protein content similar to those of coconut meal and palmkernel meal.
154. Therefore you can include cassava leaf meal instead of some oilcakes in chicken rations. In **Sri Lanka**, cassava leaf meal has been used in levels of up to 10 percent in chicken rations **instead of coconut meal**.

#### **USE OF CASSAVA LEAF MEAL IN PIG FEEDING**

155. Cassava leaf meal can be included at levels of up to 10 percent in compounded pig rations. In a 10-kg ration, you can use up to 1 kg cassava of leaf meal.
156. If you use higher levels of cassava leaf meal in rations for fattening pigs, they will not fatten well.
157. Rations also become powdery when you use high levels of leaf meal. But pig rations are normally mixed with water and fed. Therefore this is not a big problem.
158. **In areas where coconut meal is used for pig feeding, cassava leaf meal can be used instead of coconut meal.** As a substitute for coconut meal, it can be used at levels of up to 20 percent in pig rations.

## USE OF CASSAVA FORAGE IN RUMINANT FEEDING

159. In tropical climates, the grasses mature and flower quickly. They quickly become fibrous and have poor digestibility and low protein contents.

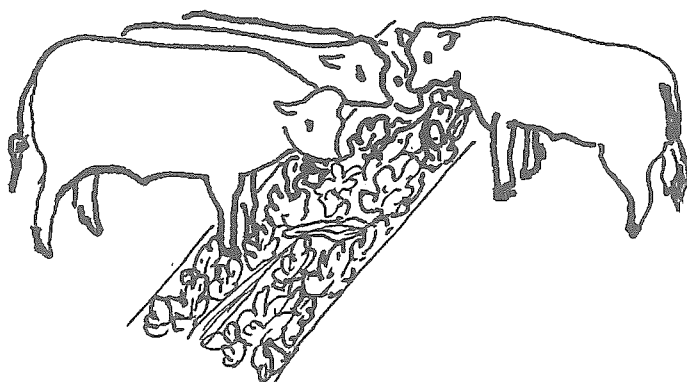


160. These problems are more severe during the dry season. The grasses are dry and are more fibrous. Animals will not get much digestible feed or protein by eating them.
161. Animals will not grow and may lose weight. To avoid this, you must feed quality forages with high protein, along with available grasses.
162. You can feed legumes that are high protein forages. In many areas, **tree legumes** are used to feed animals. *Gliricidia*, *Leucaena*, *Sesbania* and *Acacia* are some tree legumes that you may find in your area.

163. Cassava forage has a protein value equal to those of these tree legumes. Cassava forage includes leaves as well as the tender stems. It is a good supplementary feed for all ruminants.



164. To lower the cyanide level, you must wilt the forage for a few hours before feeding.
165. Animals like the wilted forage more than the fresh forage. They will eat more of the wilted forage than fresh forage.

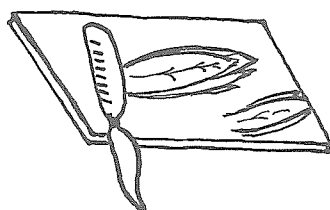


166. When you first give cassava forage, you may find that the animals are reluctant to eat. Usually it takes two to three days before the animals readily eat it.

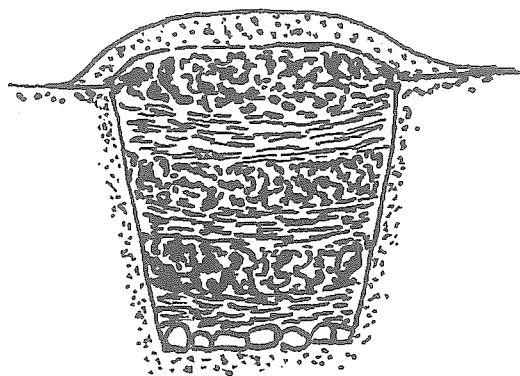


## USE OF CASSAVA FORAGE SILAGE

167. You can make a silage with cassava forage in three ways:
- by using cassava forage alone;
  - by using a mixture of cassava forage and grasses;
  - by using a mixture of cassava forage and roots.
168. When you mix the cassava forage with grasses available in your area and make a silage, you improve the quality of the silage. You will make a silage with more protein.
169. The method of making silage from cassava forage is similar to that used for making silage from cassava roots. You have also learned about making silage from grass in Booklet No. 12 (page 23).
170. The forage and the grasses must be wilted first and then chopped. Wilting is done to reduce the water content in the materials.



171. If you make silage with too much moisture, a lot of liquid will drain out of the silage. This liquid will remove nutrients. Too much moisture will also make the silage spoil.
172. You can avoid the problem of too much moisture by using layers of dry grass or straw between layers of chopped forages. Dried materials will absorb the excess moisture.



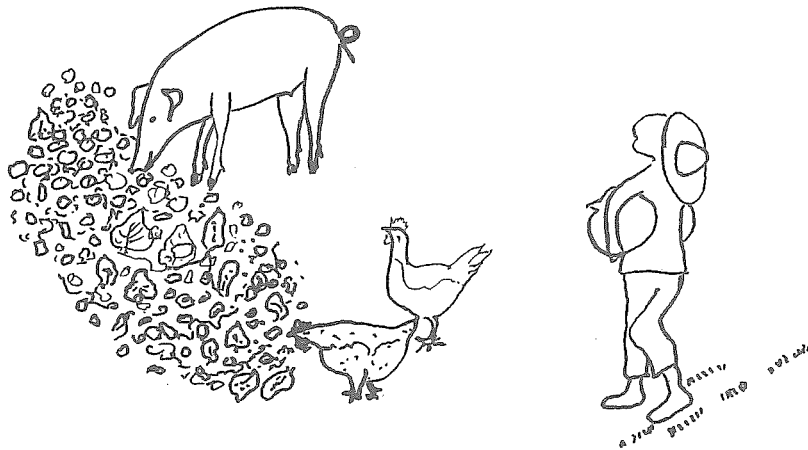
173. You can mix the chopped roots with the forage and make a silage. This silage will be well balanced. Roots will supply the energy and the forage will supply the protein.
174. In parts of **Brazil**, the whole cassava plant is used to make silage. Roots, stems and forage are chopped together, made into a silage and used to feed fattening cattle.

# SWEET POTATOES AS AN ANIMAL FEED

---

## USE OF SWEET POTATOES IN PIG FEEDING

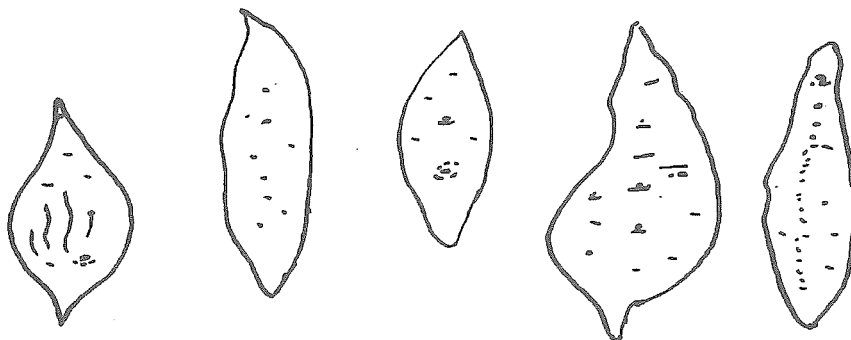
175. In many parts of China, farmers fatten their pigs mainly on sweet potatoes. They have known the value of sweet potatoes for a long time.



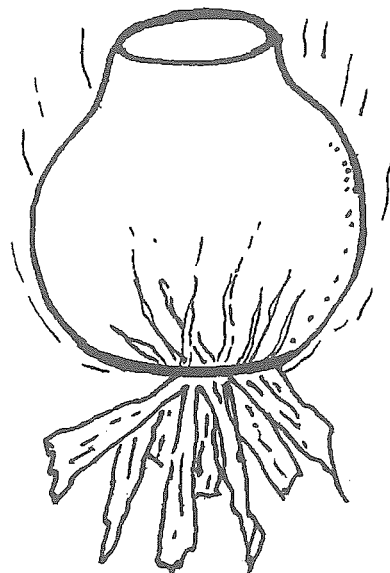
176. Chinese farmers also make dried chips from sweet potatoes, store and use them throughout the year. Some make a silage with sweet potato tubers to feed their pigs.

### Feeding fresh tubers to pigs

177. Fresh tubers can be chopped and fed to pigs. Pigs readily eat them.

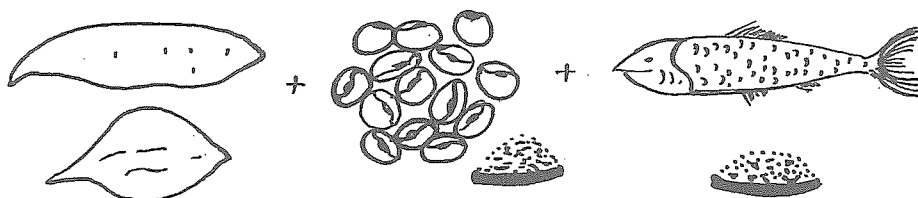


178. Fresh sweet potato tubers are better feeds than fresh cassava roots because:
- they have more protein;
  - they have no cyanide.
179. However, **tubers from some cultivars have high levels of trypsin inhibitor**. If you feed these tubers without cooking, animals will not digest enough protein. They will not grow well.
180. You can suspect high levels of trypsin inhibitors if your pigs do not grow well when fresh sweet potatoes are used as the main feed.
181. If you suspect a high level of trypsin inhibitor in the tubers, you must boil them before feeding. Boiling will destroy the trypsin inhibitor.



182. When you boil the tubers, digestibility will be increased; more protein will become available for the growth of animals.

183. You can feed the pigs with fresh sweet potatoes as much as they like.
184. You have learned earlier that you need to give protein feeds with cassava roots. Similarly sweet potatoes **cannot be used as the sole feed**. They must be fed along with protein feeds.

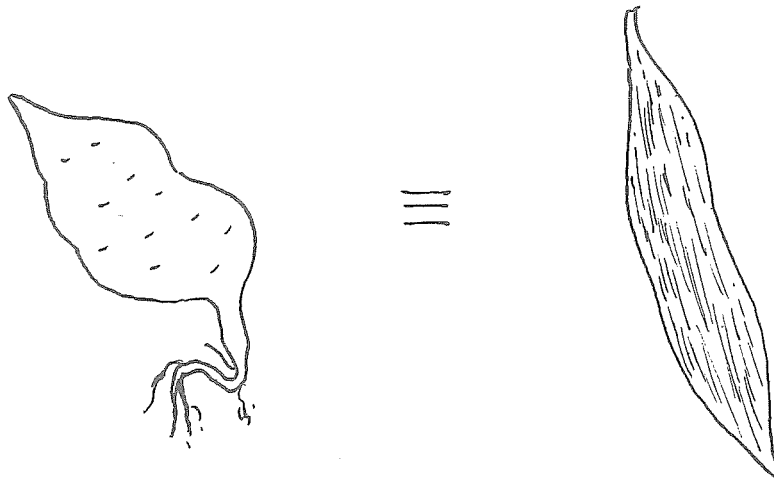


### Feeding dried chips to pigs

185. Dried sweet potato chips can be fed to pigs just like the chopped fresh tubers. In **China**, this is a common way of feeding pigs.
186. When you feed dried chips it is best to moisten them with water. Then the pigs like them better.

### Feeding sweet potato meal to pigs

187. Sweet potato meal is a good **energy** feed. It can be mixed with other feeds and used in compounded rations, just as cassava root meal is used.
188. It can be used in compounded rations instead of cereal grains. It must be mixed with protein feeds, mineral supplements and vitamin supplements.
189. The energy that pigs can get from sweet potato meal is similar to that they get from cassava meal and maize. Sweet potato meal can **completely replace** maize in pig rations.



190. However, if you suspect trypsin inhibitor may be a problem in the meal, it is safe to replace only 50 percent of the maize in your pig ration with sweet potato meal.
191. If you are now using 7 kg of maize when mixing a 10-kg pig ration, **instead** you can use 3.5 kg of maize and 3.5 kg of sweet potato meal.
192. Some examples of compounded pig rations with sweet potato meal follow. These will give you an idea as to how to mix the rations.

### Pig rations using potato meal

Ingredient	Ration for	
	growing pigs	finisher pigs
	Parts	
Maize	35	35
Sweet potato meal	35	35
Soybean meal	20	18
Fish meal	5	3
Sweet potato vine meal	4	8
Bone meal	2.5	2.5
Vitamin-mineral premix	0.3	0.3
Salt	0.2	0.2
<b>Total</b>	<b>100</b>	<b>100</b>

193. Note that sweet potato vine meal is used in these examples. Sweet potato vine meal can also be used in animal feeding.
194. When you mix high levels of sweet potato meal the ration will become dusty. You must wet the ration with water before feeding to pigs.

### **Feeding tuber silage to pigs**

195. Sweet potato tubers can also be preserved as a silage. Making sweet potato tuber silage is similar to making cassava root silage.
196. Pigs readily eat the silage. You can feed any amount of silage to pigs. You must feed the silage along with protein feeds to get good results.

### **USE OF SWEET POTATOES IN RABBIT FEEDING**

197. Sweet potato tubers are good energy feeds for rabbits. You can feed them as:
  - chopped, fresh tubers;
  - dried chips;
  - meal.
198. You can feed the rabbits with sweet potatoes in the same way as you feed the pigs. You must take the same precautions.

## USE OF SWEET POTATOES IN CHICKEN FEEDING

199. How much sweet potato meal you can put into a ration will depend on the age of the birds.
200. In rations of young birds that are less than eight weeks old, you must not use more than 20 percent sweet potato meal. If you are mixing a 10-kg ration, you must not use more than 2 kg of sweet potato meal.
201. As the birds grow bigger, you can gradually increase the amount of sweet potato meal that is used. In rations for laying chickens you can use up to 30 percent sweet potato meal.
202. Like the cassava root meal, sweet potato meal is dusty and powdery. When you use high levels of sweet potato meal, you will face similar problems.
203. Some examples of chicken rations with sweet potato meal follow.

### Chicken rations using sweet potato meal

Ingredient	Ration for	
	young chickens	laying chickens
	Parts	
Maize	40	35
Sweet potato meal	20	30
Rice bran	5	6
Soybean meal	22	16
Fish meal	8	3
Sweet potato vine meal	3	3
Bone meal	1.5	2.5
Shell grit	—	0.4
Vitamin-mineral premix	0.3	0.3
Salt	0.2	0.2
<b>Total</b>	<b>100</b>	<b>100</b>



## USE OF SWEET POTATOES IN RUMINANT FEEDING

204. Sweet potato tubers can be given to all ruminants. They can be fed as:

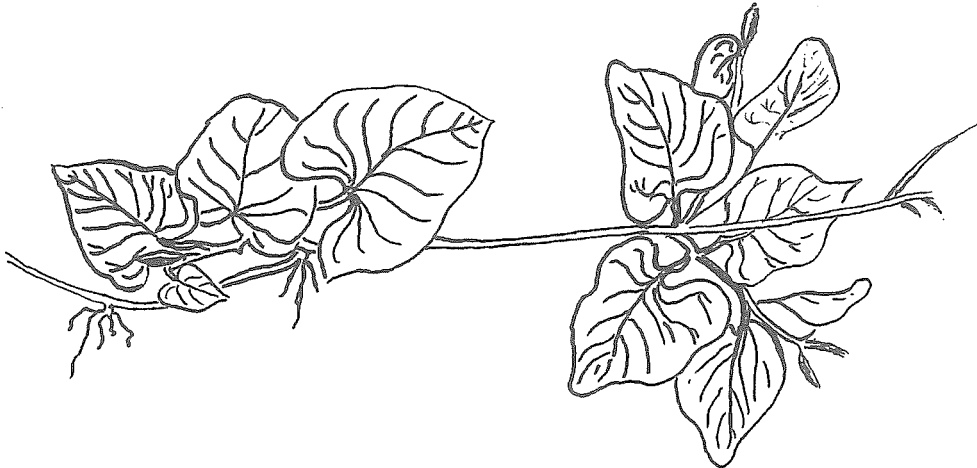
- fresh, chopped tubers;
- dried chips;
- silage.

205. If sweet potatoes are available at cheap prices, you can feed them as energy supplements along with locally available grasses:

- during the dry season;
- for fattening animals and milking animals.

## SWEET POTATO VINES AS AN ANIMAL FEED

206. When you harvest sweet potato tubers, large amounts of vines are available. Most people throw away the vines. You must know that they have good feed value.



207. Sweet potato vines can be used as a protein feed for animals. They do not have as much protein as cassava leaves, but they do have more protein than grasses that may be available in your area.
208. 100 kg of dried sweet potato vines can supply 10-12 kg of protein. Grasses that commonly grow in tropical climates supply much less protein than this.
209. Sweet potato vines have no substances that are bad for animals. They can be safely fed to animals.

### **USE OF VINES IN PIG FEEDING**

210. Sweet potato vines can be fed to pigs either in the fresh form or after drying.

211. Pigs readily eat the vines. You can feed the pigs any amount of fresh vines without restriction.
212. You can also dry the vines and grind them into a meal. Vines dry easily. By drying 100 kg of fresh vines, you can get about 30 kg of dried vines.
213. You can use sweet potato vine meal in compounded pig rations, but only at **low levels**.
214. You must not use more than 5 percent vine meal in pig rations. If you are mixing a 10-kg ration, the maximum amount of vine meal that you can use is 500 g.

#### USE OF VINES IN RABBIT FEEDING

215. If you have rabbits, you can make good use of sweet potato leaves. They like sweet potato leaves from the vines.



216. Sweet potato leaves give the protein needed for growth of rabbits. You can rear the rabbits on sweet potato leaves and grasses and get good growth.

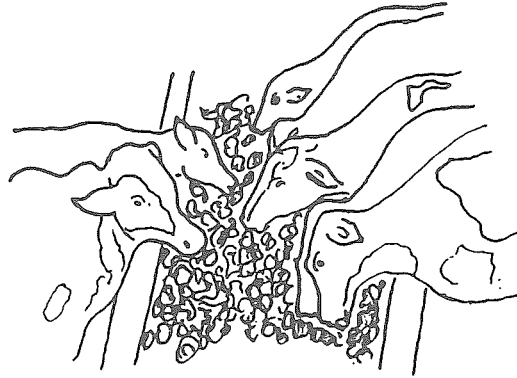
## USE OF VINES IN CHICKEN FEEDING

217. On many chicken farms, fresh green leaves are chopped and given to birds, in addition to mash. This is practised:
- to supply pigments;
  - to supply minerals and vitamins.
218. Giving green leaves to chickens is a good practice. You can reduce the amount of mash given to the chickens when you give additional greens.
219. You can use fresh sweet potato vines for chicken feeding.
220. Vine meal can be included in compounded chicken rations **at low levels**. In a 10-kg ration, you can use about 300 g of sweet potato vine meal.

## USE OF VINES IN RUMINANT FEEDING

221. Fresh sweet potato vines make good feed for all ruminants. They can be given without any restriction.
222. When you feed sweet potato vines to milking animals or fattening animals, you don't have to give any other protein supplement. Vines alone can supply all the protein needed by these animals.
223. Cattle fed on sweet potato vines alone can put on more than 500 g of body weight per day. This shows the feed value of sweet potato vines to ruminant animals.

224. You will usually have a lot of fresh vines at harvest time. If you cannot use all the fresh vines to feed animals, you can preserve the extra vines as **sweet potato vine silage**.
225. The method of making silage from vines is similar to that used for making silage from any other forage. You must follow the same principles.



226. To get a good silage from sweet potato vines, you have to follow an **additional step**.
227. You must put in an **additive** that will supply carbohydrates that will ferment quickly.
228. If you do not put in the additive, the silage may not be good. Moulds may grow and silage will be spoiled.
229. Sweet potato tubers, cassava roots and molasses are good examples of additive materials. Molasses is the best additive of all.
230. If you are making 100 kg of silage, you must add 2-4 kg of molasses.
231. A good sweet potato vine silage will be brownish-green in colour. It will have a pleasant fruity smell. Animals will like it. You can feed the vine silage free choice to all ruminants.



**WHERE TO PURCHASE FAO PUBLICATIONS LOCALLY  
POINTS DE VENTE DES PUBLICATIONS DE LA FAO  
PUNTOS DE VENTA DE PUBLICATIONES DE LA FAO**

1/6/95

• **ANGOLA**

Empresa Nacional do Disco e de Publicações, ENDIPU-U.E.E.  
Rua Cirilo da Conceição Silva, N° 7  
C.P. N° 1314-C  
Luanda

• **ARGENTINA**

Librería Agropecuaria  
Pasteur 743  
1028 Buenos Aires  
Oficina del Libro Internacional  
Alberti 40  
1082 Buenos Aires

• **AUSTRALIA**

Hunter Publications  
P.O. Box 404  
Abbotsford, Vic. 3067

• **AUSTRIA**

Gerold Buch & Co.  
Weihburggasse 26  
1010 Vienna

• **BANGLADESH**

Association of Development Agencies in Bangladesh  
House No. 1/3, Block F, Lalmatia  
Dhaka 1207

• **BELGIQUE**

M.J. De Lannoy  
202, avenue du Roi  
1060 Bruxelles  
CCP 000-0808993-13

• **BOLIVIA**

Los Amigos del Libro  
Perú 3712, Casilla 450  
Cochabamba;  
Mercado 1315, La Paz

• **BOTSWANA**

Botsalo Books (Pty) Ltd  
P.O. Box 1532  
Gaborone

• **BRAZIL**

Fundação Getúlio Vargas  
Praia do Botafogo 190, C.P. 9052  
Rio de Janeiro  
Núcleo Editora da Universidade Federal Fluminense  
Rua Miguel de Frias N° 9  
Icaraí-Niterói  
24 220-000 Rio de Janeiro  
Editora da Universidade Federal do Rio Grande do Sul  
Av. João Pessoa 415  
Bairro Cidade Baixa  
90 040-000 Porto Alegre/RS  
Book Master Livraria  
Rua do Catete 311 lj. 118/119  
20031-001 Catete  
Rio de Janeiro

• **CANADA**

Le Diffuseur Gilles Vermette Inc.  
C.P. 85, 151 av. de Mortagne  
Boucherville, Quebec J4B 5E6  
UNIPUB  
4611/F Assembly Drive  
Lanham MD 20706-4391 (USA)  
Toll-free 800 233-0504 (Canada)

• **CHILE**

Librería - Oficina Regional FAO  
Calle Bandera 150, 8° Piso  
Casilla 10095, Santiago-Centro  
Tel. 699 1005  
Fax 696 1121/696 1124  
Universitaria Textolibros Ltda.  
Avda. L. Bernardo O'Higgins 1050  
Santiago

• **COLOMBIA**

Banco Ganadero  
Revista Carta Ganadera  
Carrera 9ª N° 72-21, Piso 5  
Bogotá D.E.  
Tel. 217 0100

• **CONGO**

Office national des librairies populaires  
B.P. 577  
Brazzaville

• **COSTA RICA**

Librería Lehmann S.A.  
Av. Central  
Apartado 10011  
San José

• **CÔTE D'IVOIRE**

CEDA  
04 B.P. 541  
Abidjan 04

• **CUBA**

Ediciones Cubanas, Empresa de Comercio Exterior de Publicaciones  
Obispo 461, Apartado 605  
La Habana

• **CZECH REPUBLIC**

Artia Pegas Press Ltd  
Import of Periodicals  
Palác Metro, P.O. Box 825  
Národní 25, 111 21 Praha 1

• **DENMARK**

Munksgaard, Book and Subscription Service  
P.O. Box 2148  
DK 1016 Copenhagen K.  
Tel. 4533128570  
Fax 4533129387

• **DOMINICAN REPUBLIC**

CUESTA - Centro del libro  
Av. 27 de Febrero, esq. A. Lincoln  
Centro Comercial Nacional  
Apartado 1241  
Santo Domingo

• **ECUADOR**

Libri Mundi, Librería Internacional  
Juan León Mera 851  
Apartado Postal 3029  
Quito

• **EGYPT**

The Middle East Observer  
41 Sherif Street  
Cairo

• **ESPAÑA**

Mundi Prensa Libros S.A.  
Castelló 37  
28001 Madrid  
Tel. 431 3399  
Fax 575 3998  
Librería Agrícola  
Fernando VI 2  
28004 Madrid  
Librería Internacional AEDOS  
Consejo de Ciento 391  
08009 Barcelona  
Tel. 301 8615  
Fax 317 0141  
Librería de la Generalitat de Catalunya  
Rambla dels Estudis 118  
(Palau Moja)  
08002 Barcelona  
Tel. (93) 302 6462  
Fax (93) 302 1299

• **FINLAND**

Akateeminen Kirjakauppa  
P.O. Box 218  
SF-00381 Helsinki

• **FRANCE**

Lavoisier  
14, rue de Provigny  
94236 Cachan Cedex  
Editions A. Pedone  
13, rue Soufflot  
75005 Paris.  
Librairie du Commerce International  
24, boulevard de l'Hôpital  
75005 Paris

• **GERMANY**

Alexander Horn Internationale  
Buchhandlung  
Kirchgasse 22, Postfach 3340  
D-65185 Wiesbaden

• **GHANA**

Uno Verlag  
Poppelsdorfer Allee 55  
D-53115 Bonn 1  
S. Toeche-Mittler GmbH  
Versandbuchhandlung  
Hindenburgstrasse 33  
D-64295 Darmstadt

• **GUYANA**

SEDCO Publishing Ltd  
Sedco House, Tabon Street  
Off Ring Road Central, North Ridge  
P.O. Box 2051  
Accra

• **GUYANA**

Guyana National Trading Corporation Ltd  
45-47 Water Street, P.O. Box 308  
Georgetown

• **HAÏTI**

Librairie «A la Caravelle»  
26, rue Bonne Foi, B.P. 111  
Port-au-Prince

• **HONDURAS**

Escuela Agrícola Panamericana, Librería RTAC  
El Zamorano, Apartado 93  
Tegucigalpa  
Oficina de la Escuela Agrícola Panamericana en Tegucigalpa  
Blvd. Morazán, Apts. Glapson  
Apartado 93  
Tegucigalpa

• **HUNGARY**

Librotrade Kft.  
P.O. Box 126  
H-1656 Budapest

• **INDIA**

EWP Affiliated East-West Press PVT, Ltd  
G-1/16, Ansari Road, Darya Gany  
New Delhi 110 002  
Oxford Book and Stationery Co.  
Scindia House, New Delhi 110 001;  
17 Park Street, Calcutta 700 016  
Oxford Subscription Agency  
Institute for Development Education  
1 Anasuya Ave., Kilpauk  
Madras 600 010  
Periodical Expert Book Agency  
D-42, Vivek Vihar, Delhi 110095

• **IRAN**

The FAO Bureau, International and Regional Specialized Organizations Affairs  
Ministry of Agriculture of the Islamic Republic of Iran  
Keshavarz Bld, M.O.A., 17th floor  
Teheran

• **IRELAND**

Publications Section  
Government Stationery Office  
4-5 Harcourt Road  
Dublin 2

• **ISRAEL**

R.O.Y. International  
P.O. Box 13056  
Tel Aviv 61130

• **ITALY**

Librería Scientifica Dott. Lucio de Biasio "Aieiou"  
Via Coronelli 6  
20146 Milano  
Librería Concessionaria Sansoni S.p.A. "Licosa"  
Via Duca di Calabria 1/1  
50125 Firenze



**WHERE TO PURCHASE FAO PUBLICATIONS LOCALLY  
POINTS DE VENTE DES PUBLICATIONS DE LA FAO  
PUNTOS DE VENTA DE PUBLICACIONES DE LA FAO**

**FAO Bookshop**

Viale delle Terme di Caracalla  
00100 Roma  
Tel. 52255688  
Fax 52255155  
E-mail: publications-sales@fao.org

**• JAPAN**

**Far Eastern Booksellers  
(Kyokuto Shoten Ltd)**  
12 Kanda-Jimbocho 2 chome  
Chiyoda-ku - P.O. Box 72  
Tokyo 101-91  
**Maruzen Company Ltd**  
P.O. Box 5050  
Tokyo International 100-31

**• KENYA**

**Text Book Centre Ltd**  
Kijabe Street, P.O. Box 47540  
Nairobi

**• LUXEMBOURG**

**M.J. De Lannoy**  
202, avenue du Roi  
1060 Bruxelles (Belgique)

**• MALAYSIA**

**Electronic products only:**  
**Southbound**  
Sendirian Berhad Publishers  
9 College Square  
01250 Penang

**• MALI**

**Librairie Traore**  
Rue Soundiata Keita X 115  
B.P. 3243  
Bamako

**• MAROC**

**La Librairie Internationale**  
70 Rue T'ssoule  
P.O. Box 302 (RP)  
Rabat  
Tel. (07) 75-86-61

**• MEXICO**

**Libreria, Universidad Autónoma de  
Chapingo**  
56230 Chapingo  
**Libros y Editoriales S.A.**  
Av. Progreso N° 202-1° Piso A  
Apdo. Postal 18922, Col. Escandón  
11800 México D.F.

**• NETHERLANDS**

**Roodveldt Import b.v.**  
Brouwersgracht 288  
1013 HG Amsterdam

**• NEW ZEALAND**

**Legislation Services**  
P.O. Box 12418  
Thorndon, Wellington

**• NICARAGUA**

**Libreria HISPAMER**  
Costado Este Univ. Centroamericana  
Apdo. Postal A-221  
Managua

**• NIGERIA**

**University Bookshop (Nigeria) Ltd**  
University of Ibadan  
Ibadan

**• NORWAY**

**Narvesen Info Center**  
Bertrand Narvesens vei 2  
P.O. Box 6125, Etterstad  
0602 Oslo 6  
Tel. (+47) 22-57-33-00  
Fax (+47) 22-68-19-01

**• PAKISTAN**

**Mirza Book Agency**  
65 Shahrah-e-Quaid-e-Azam  
P.O. Box 729, Lahore 3

**• PARAGUAY**

**Libreria INTERCONTINENTAL**  
Editora e Impresora S.R.L.  
Caballero 270 c/Mcal Estigarribia  
Asunción

**• PERU**

**INDEAR**  
Jirón Apurimac 375, Casilla 4937  
Lima 1

**• PHILIPPINES**

**International Booksource Center (Phils)**  
Room 1703, Cityland 10  
Condominium Cor. Ayala Avenue &  
H.V. de la Costa Extension  
Makati, Metro Manila

**• POLAND**

**Ars Polona**  
Krakowskie Przedmiescie 7  
00-950 Warsaw

**• PORTUGAL**

**Livraria Portugal,  
Dias e Andrade Ltda.**  
Rua do Carmo 70-74, Apartado 2681  
1117 Lisboa Codex

**• SINGAPORE**

**Select Books Pte Ltd**  
03-15 Tanglin Shopping Centre  
19 Tanglin Road  
Singapore 1024

**• SOMALIA**

**"Samater's"**  
P.O. Box 936  
Mogadishu

**• SOUTH AFRICA**

**David Philip Publishers (Pty) Ltd**  
P.O. Box 23408  
Claremont 7735  
South Africa  
Tel. Cape Town (021) 64-4136  
Fax Cape Town (021) 64-3358

**• SRI LANKA**

**M.D. Gunasena & Co. Ltd**  
217 Olcott Mawatha, P.O. Box 246  
Colombo 11

**• SUISSE**

**Buchhandlung und Antiquariat  
Heinmann & Co.**  
Kirchgasse 17  
8001 Zurich

**UN Bookshop**

Palais des Nations  
CH-1211 Genève 1  
**Van Diermen Editions Techniques**

**ADECO**

Case Postale 465  
CH-1211 Genève 19

**• SURINAME**

**Vaco n.v. in Suriname**  
Domineestraat 26, P.O. Box 1841  
Paramaribo

**• SWEDEN**

**Books and documents:**

**C.E. Fritzes**  
P.O. Box 16356  
103 27 Stockholm

**Subscriptions:**

**Vennergren-Williams AB**  
P.O. Box 30004  
104 25 Stockholm

**• THAILAND**

**Suksapan Panit**  
Mansion 9, Rajdamnern Avenue  
Bangkok

**• TOGO**

**Librairie du Bon Pasteur**  
B.P. 1164  
Lomé

**• TUNISIE**

**Société tunisienne de diffusion**  
5, avenue de Carthage  
Tunis

**• TURKEY**

**Kultur Yayiniari is - Turk Ltd Sti.**  
Ataturk Bulvari N° 191, Kat. 21  
Ankara  
**Bookshops in Istanbul and Izmir**

**• UNITED KINGDOM**

**HMSO Publications Centre**  
51 Nine Elms Lane  
London SW8 5DR  
Tel. (071) 873 9090 (orders)  
(071) 873 0011 (inquiries)  
Fax (071) 873 8463  
**and through HMSO Bookshops**  
**Electronic products only:**  
**Microinfo Ltd**  
P.O. Box 3, Omega Road, Alton  
Hampshire GU34 2PG  
Tel. (0420) 86848  
Fax (0420) 89889

**• URUGUAY**

**Libreria Agropecuaria S.R.L.**  
Buenos Aires 335  
Casilla 1755  
Montevideo C.P. 11000

**• USA**

**Publications:**

**UNIPUB**

4611/F Assembly Drive  
Lanham MD 20706-4391  
Toll-free 800 274-4888  
Fax 301-459-0056

**Periodicals:**

**Ebsco Subscription Services**

P.O. Box 1431  
Birmingham AL 35201-1431

Tel. (205)991-6600

Telex 78-2661

Fax (205)991-1449

**The Faxon Company Inc.**

15 Southwest Park

Westwood MA 02090

Tel. 6117-329-3350

Telex 95-1980

Cable FW Faxon Wood

**• VENEZUELA**

**Tecni-Ciencia Libros S.A.**

Torre Phelps-Mezzanina

Plaza Venezuela

Caracas

Tel. 782 8697/781 9945/781 9954

**Tamanaco Libros Técnicos S.R.L.**

Centro Comercial Ciudad Tamanaco

Nivel C-2

Caracas

Tel. 261 3344/261 3335/959 0016

**Tecni-Ciencia Libros, S.A.**

Centro Comercial, Shopping Center

Av. Andrés Bello, Urb. El Prebo

Valencia, Ed. Carabobo

Tel. 222 724

**Fudeco, Librería**

Avenida Libertador-Este

Ed. Fudeco, Apartado 254

Barquisimeto C.P. 3002, Ed. Lara

Tel. (051) 538 022

Fax (051) 544 394

Télex (051) 513 14 FUDEC VC

**Fundación La Era Agrícola**

Calle 31 Junin Ota

Coromoto 5-49, Apartado 456

Mérida

**Librería FAGRO**

Universidad Central de Venezuela (UCV)

Maracay

**• ZIMBABWE**

**Grassroots Books**

100 Jason Moyo Avenue

P.O. Box A 267, Avondale

Harare;

61a Fort Street

Bulawayo

**Other countries / Autres pays / Otros países**

Distribution and Sales Section

Publications Division, FAO

Viale delle Terme di Caracalla

00100 Rome, Italy

Tel. (39-6) 52251

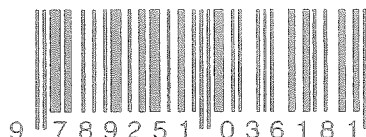
Fax (39-6) 52253152

Telex 625852/625853/610181 FAO I

E-mail: publications-sales@fao.org

This is one of two booklets in the Better Farming Series devoted to the use and processing of cassava and sweet potatoes for animal feeding. It describes various ways of feeding different parts of the plants (roots, peels and foliage) in several forms (fresh, dried, in meal or silage) to different types of animal: monogastrics (pigs, chickens and rabbits) or ruminants (cattle, buffaloes, sheep and goats). It gives practical recommendations to the farmer and extension worker, for the best use of these feeds. In particular it insists on the need for protein, mineral and vitamin supplements.

ISBN 92-5-103618-7      ISSN 0259-2770



P-23

V4770E/1/9.95/4000