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Magazine

Gaining the Edge in

Broiler Business

DEMYSTIFYING CATTLE FATTENING

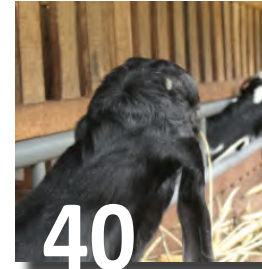
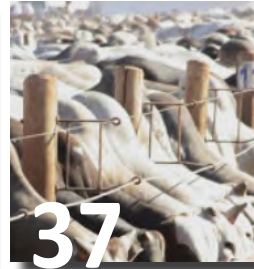
GROWING PEAS FOR PROFIT

5 TIPS FOR EFFECTIVE BOER GOAT BREEDING





In this Issue



5 **Livestock**
Gaining the EDGE in Broiler Business

16 **Crops**
Growing Peas for Profit

25 **Crops**
Broccoli Production Guide

30 **Livestock**
Demystifying Cattle Fattening

37 **Success Story**
Meet the Farmer: Dadirai Mabaya

38 **Livestock**
Goat Production: Feed Types

40 **Livestock**
5 Tips for Effective Boer Goat Breeding

42 **Crops**
Crop Planting Calendar

45 **The Agri Expert Answers**
Q & A.

46 **Games**
Word Search.

47 **Games**
Spot the difference.

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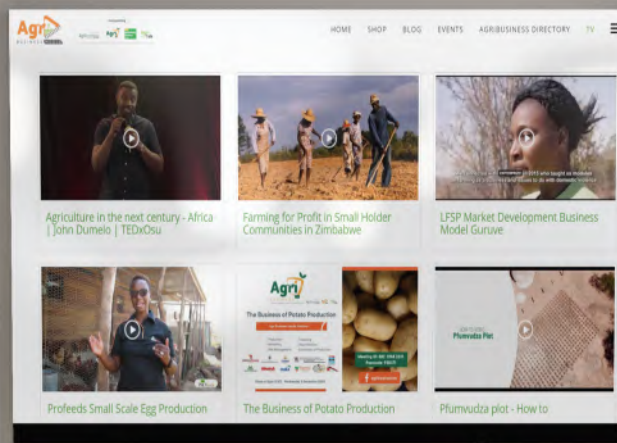


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Gaining the EDGE in Broiler Business

The broiler value chain is one of the fastest growing industries in Zimbabwe.

Most broiler farmers understand that the ability of their businesses to earn strong returns is greatest when they keep their production costs below their income, and if they enhance efficiency. But how do we keep production costs low, we need to look at feed efficiency, as it constitutes the highest percentage of the production costs.

We will also discuss ways to improve broiler

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business beyond nutrition.

How to Improve FCR (Feed Conversion Ratio) and Reduce the Cost of Feed

The feed conversion ratio (FCR) is the amount of feed ingested by an animal which can be converted into one kilo of live weight. This definition also applies to a single-age poultry flock held in an enclosed house. It is important that this house contains an indication of

the amount of feed that has been eaten. The end of a rearing cycle is a good opportunity to undertake the technical-economic balance sheet of the cycle taking account of the following parameters:

- The technical FCR is the total amount of ingested feed divided by the number of animals that have exited the house
- The economic FCR is the total amount of feed ingested divided by the weight of poultry animals that

....continued on page 7

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....continued from page 5

can be accepted at the slaughterhouse. That is to say that the weight of seized meat is deducted from the total weight of goods.

- The corrected FCR at fixed weight is the average ratio of different flocks considering that they have all been slaughtered at the same weight. In other words, these animals are all brought down to the same weight through calculations.
- The corrected FCR at fixed age is determined by estimating the weight that these chickens might have reached at the same age, depending on what they have consumed.

The FCR and hence, the amount of feed ingested, are the major variables that can help to set the cost of a poultry animal. Depending on the species and countries considered, the share of feed makes up 40 to 70% of cost production. Poultry, including broiler, remain the species whose FCR is the lowest (it can be as low as 1.5). Unlike other species, poultry are not religiously banned; this is why their consumption has no impediment and their yearly growth rate averages 3%.



Improving poultry FCR and reducing feed costs Poultry's FCR are first determined by the chosen genetic selection mode and the rearing conditions applied, as follows:

- A chicken of low-growing strain s will have an average FCR value ranging between 2.8 to 3.2
- A standard broiler chicken reared in an enclosed house will have an FCR between 1.3 to 1.6.

By comparing these two chickens of different strains that have been fed with raw materials of same origin, it turns out that the first chicken will end up costing twice as much

as the second.

Despite these differences, FCR calculations are very relevant.

Evolving from an initial FCR of 3.2 to 2.8 in the case red label chicken implies that 800 grams of feed have been saved. Besides the type of farming and genetic selection applied, the improvement of FCRs lies on various factors:

- On the suitable transformation of raw materials, on the nutritional standards and physical presentation of feed, on the chosen genetics and the type of farming used.
- On the rearing conditions applied, animals' comfort and their

The FCR and hence, the amount of feed ingested, are the major variables that can help to set the cost of a broiler chicken.

access to water and feed.

Any element likely to cause discomfort, difficulties in accessing water and feed, as well as the animals' aversion for specific types of feed, could lead to heterogeneous growth, health issues and to seizures at the slaughterhouse. The eventual impact may lead to significant drops in FCRs.

Ways to improve your broiler business.

After the feed arrives at the farm, there are five pointers that will help improve feed efficiency in broilers.

Improving feed efficiency is usually associated with improved profitability.

Most measures to improve this useful index of productivity are by balancing the ratio between energy and amino acids, and (or) by improving nutrient digestibility by a number of different means. But, the feed efficiency rate can be improved even after the feed is mixed and delivered at the farm. Here are five tips to ensure broilers take the most out of the feed they are given on any farm.

Feed Storage

Moulds consume



valuable nutrients and produce mycotoxins. Mouldy feed is not only unpalatable, but also toxic as well. Quite often, feed is delivered into silos (for large operations) or storerooms (for small operations) that are never cleaned. In humid and warm climates, mould growth is easy to occur, and even in apparently empty silos, there are hot spots (patches of old mouldy feed adhering to the inside surfaces of silos) that can serve as the leaven for the next batch of fresh feed.

Adding a mycotoxin binder and a mould inhibitor is not enough. Storage must be periodically inspected and cleaned thoroughly. Usual dosage rates recommended for mycotoxins in feed do not take into account this issue, which can be quite serious under unfavorable conditions.

A factor that greatly enhances feed efficiency is the correct placement of drinkers close to the feeders, but not so close as to cause feed spoilage.

Use feeders that don't waste feed

It might appear obvious to buy feeders that minimize feed wastage, but low-cost is always an alluring factor that quite often makes us buy something less efficient in the long-run. Feeders should also be managed (cleaning, placement, distances, number of birds per feeder, etc.) so that feed consumption is neither an opportunity to beat boredom nor a hurried fight to eat. Quite often a factor that greatly enhances feed efficiency is the correct placement of drinkers

Use of the correct feeders and waterers is important.

....continued on page 10



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....continued from page 8

close to the feeders, but not so close as to cause feed spoilage.

Lights on and off

It has been suggested that a constant lighting program (such as 23 hours light and 1 hour darkness) might not be the best in terms of feed digestibility. Under constant lighting, birds tend to over consume feed, which tends to increase feed rate passage. Given that birds are fed at or near maximum genetic potential levels, this extra feed they consume has limited time to interact with digestive enzymes, resulting in reduced feed digestibility. In contrast, a lights-on, lights-off program (for example, 1 hour light, 1 hour darkness, and so on) allows birds to fully digest their feed while resting (which also improves feed efficiency as birds do not walk aimlessly all day), and gives them enough time to “refill” during light hours. The only problem with this system is that there should be enough feeding spaces for all birds to eat simultaneously, something that requires careful pre-placement feeder management.

Always follow your day



old chick or feed supplier recommendations.

Avoid heavy body weight at market age

If you need to attain a certain market age or market weight, then you should probably follow the guidelines of your contracting partner or market requirements.

But, if you sell on the open market, it pays to keep in mind that feed efficiency becomes a bit worse with each day the birds age. This is mostly due to the fact that birds have a greater body mass to maintain each day — and maintenance requires both energy and amino acids. So, finding the minimum weight per bird that is acceptable will also minimize feed efficiency. Of course, this does not necessarily mean maximal profit-

ability, and to this end, other parameters should be consulted: cost per weight gain, or weight gain per given floor surface, etc.

Keep birds healthy

One more obvious observation, but it is always worth repeating: sick birds do not grow, and if they do not grow, feed efficiency is never ideal. Sick or sub-clinical affected birds don't eat as much as healthy birds, and what they eat usually goes to fighting off the disease. In addition, they might even break down muscle proteins, which reduces their body weight, making feed efficiency the worst possible. In contrast, healthy birds, especially those with a very healthy digestive system, will

....continued on page 12

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....continued from page 10

utilize nutrients in the feed at maximal efficiency. Perhaps sub-clinical diseases are the worst “robbers” of feed efficiency points, if only because they go unnoticed, whereas we investigate anything else that might have caused this drop in performance. Bio security is important.

Bio security is defined as active measures or programs taken to reduce the likelihood of diseases, pest, chemicals, infections and other threats entering the farm and eliminating infections from the farm. These threats can be spread through other animals, wind humans, vehicles and equipment. Deliberate transmission is an act of terrorism.

At national level, the Veterinary Department under Ministry of Livestock is responsible. Many times, restrictions on livestock movement have been put in place to control disease like avian flu. The government also controls importation of poultry and related products to curb diseases.

Bio security is more effective when applied from the farm level.

Unlike what many farmers may think, bio secu-



urity is directly linked to profits regardless of your production scale. Economists estimate cost of diseases to be 5% of the total production costs.

The costs of treatment have never been lower than prevention therefore bio security reduces your costs of production.

Dangers of poor bio security

- High mortality
- Heavy irrecoverable losses
- Loss of uniformity
- Poor meat quality
- Poor feed conversion efficiency
- Exposes other farmers to diseases
- Threat to investment

Bio security management

Pathogens or disease-causing agents need to be kept away from the farm and the

following are ways or levels in which this can be achieved. Protection around the farm from fence to inside the broiler housing is key. Bio security is everybody’s responsibility.

Housing

Whilst there are several other factors of production farmers need to consider, without proper environmental conditions farmers can not reach the maximum broiler growth potential. Basic housing needs for broilers include: temperature control (especially during brooding), ventilation, optimum humidity, provision for food and water, security (protection from thieves and predators). Broiler house design is therefore an important factor.

Adequate ventilation

Always keep in mind ventilation when planning broiler housing. Long

Sick birds do not grow, and if they do not grow, feed efficiency is never ideal.

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and narrow structures are recommended as they promote air circulation unlike square designs. A well-designed housing eliminates unwanted gases that include carbon dioxide and ammonia. Depending on the climatic conditions farmers may build structures with or without solid walls. Extraction fans can be installed to manage ventilation.

Temperature control

Broilers require optimum temperatures for maximum productivity. Proper structures should allow farmers to control temperatures. Some designs have drop side curtains that can be opened or closed to suit the required temperature. Orienting the houses on east west axis reduces exposure to direct sunlight.

Space requirements

Broiler space requirements depends on the size and age. The guide is 10 to 12 birds per square meter.

Predators

Chickens need protection from many predators including snakes, wild cats, dogs, rats and other wild animals. An ideal housing should protect birds from predators to avoid economic losses.



Location

East to West orientation on a flat surface with well drained soils. The closer to supplies and market the better as it reduces transport costs. Location should be far from other poultry projects, at least 1.5km.

Cleanliness

It is recommended to keep all areas in and around bird houses clean.

Compacted surfaces are easier to clean. If the area has grass around, it has to be kept very short to reduces the chances of harboring pests. Stagnant water should be avoided by promoting runoff gradient and surfaces.

Regular cleaning and disinfection reduces the number of bacteria and breaks the cycle of infec-

tion. This is done after every batch. The process involves;

- Drying out the house
- Removing organic material
- Flushing with water where possible
- Disinfecting

A break between disinfection and restocking allows efficient and thorough cleaning. If possible the period between the batches can be 14 days. If not, at least 2 days after disinfection should be allowed. To check if the cleaning process was done properly and efficiently, swabs can be taken for microbial assessment. A hygiene specialist can assist on collection and handling of samples.

It should be noted however, that:

Temperature control is critical

- Disinfectants do not kill all organisms all the time
- Disinfectants need to be in contact with the organism for a period of time for effectiveness, approximately 30 minutes
- The concentration of disinfection determines the contact period required,
- Surfaces and boots should be cleaned with a brush first before disinfection
- Always check and adhere to manufacturer's instructions on disinfectants
- Keep records of disinfectant use and efficacy
- Follow manufacturers recommendations for disposal



one point is taken into consideration and feed efficiency improves by a bit, it means increased profitability, especially since all of the above are routine management measures.

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Conclusion

Feed conversion ratio (FCR) measures the feed intake per unit output (eggs, meat, milk). The lower the FCR the lesser the feed cost. Animals with low FCR are efficient in converting feed to output. If you want to reduce your cost of production, always think of ways you can reduce the FCR.

Obviously, not all of the above pointers are applicable in every single farm. But, even if

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Growing Peas for Profit

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Introduction

When you think of backyard farming, most likely you think of tomatoes, onions or maybe even carrots but with the same ease, you could plant peas and enjoy a good harvest without too much farming expertise.

Pea is an important nutritious leguminous vegetable that is widely cultivated throughout the world. It is a cool-season, frost-hardy, crop extensively grown in temperate zones but also restricted to cooler altitudes in the tropics and winter seasons in the subtropics. It is a rich source of proteins, amino acids,

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sugars, carbohydrate, vitamins A and C, calcium and phosphorous, and also has a small quantity of iron.

Climatic requirements

Peas is grown under various weather conditions. It requires a cold and dry climate. The long cold spell helps in increasing yield. Pea seed can germinate even at a minimum temperature of 5 oC but the process is slow. The optimum temperature for germination is about 22 oC but at higher temperatures, germination is rapid. The optimum temperature for good growth is be-

tween 1 oC to 18 oC.

Soil requirements

Pea can be grown on all types of soils but prefers well-drained sandy loam soils. Pea prefers soils that do not dry out. The soil should be rich in organic matter as it enhances better growth by supplying nutrients. Pea does not thrive in acidic, alkaline, or saline soils. It grows best at a pH of 6.5. If the pH is less than 6.0, then it should be amended using lime to improve the soil condition. For free soil pH testing, please visit Windmill Laboratories at 21 Coventry Road, Workington, Harare or simply call +2634753784/93.

Cultivation practices

Land preparation

The field should be prepared well by ploughing but the soils should not be pulverised or made too fine. However, it must be free from weeds and stubble. Well-decomposed farmyard manure at 25 to 30 t/ha can be applied during ploughing. After ploughing, the field should be levelled to allow proper distribution of irrigation water.

Seed treatment/Inoculation

Peas are propagated by

seed. About 70 to 75 kg/ha seed is required to plant out one hectare of crop. Pea seeds may be treated with Rhizobium culture. The bacterium used for inoculations is Rhizobium leguminosarum. This will help fix atmospheric nitrogen (up to 50 kg/ha) and reduce nitrogen fertiliser application. The seed should not be exposed to direct sunlight after treatment with Rhizobium inoculum.

Rhizobium inoculant can be obtained from the Zimbabwean Department of Research and Specialist Services. It is packed in sachets with

clear instructions on how to apply it to seed.

Application of inoculant to the seed is an extremely important procedure. Many failures with nitrogen fixation have been associated with improper application technique. Thorough coverage of seed is critical because seeds not exposed to bacteria will result in plants that are unable to fix nitrogen. Inoculants are living organisms, so proper storage and handling are important. Producers should refer to the manufacturer's package labels to review proper inoculum rate and han-

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dling procedure.

After crop establishment, growers should check their fields to determine if inoculation was successful. Normally nodules will form on the roots two to four weeks after emergence.

To check for nodulation, carefully dig up a few plants and gently clear the soil from the root mass. Nodules will be present both on the primary root and on the lateral roots. Effective nodules will have a pink to red coloration on their interior. If nodulation does not occur and soil nitrogen levels are low, an application of nitrogen fertiliser over the top may be required to optimise seed yields. Nitrogen fixation will take place from about four weeks after emergence through seed formation.

If Rhizobium inoculum is not available, 200 kg of soil (2-10 cm surface soil) can be collected from a particular area, where Rhizobium had been applied before, or a leguminous crop had been cultivated luxuriantly, and should be broadcasted over the field.

Planting

Pea is normally sown directly into the fields



where it is grown to maturity, but it can also be sown early in pots in a greenhouse, for planting out. Sow early in March, second sowing in April, third sowing in May, and late sowing using early varieties in June or even to early July. About 70 to 75 kg/ha seed is required to plant out one hectare of crop.

Cultivate the soil well and leave it soft and open. Make a shallow drill about the width of a spade-head and 5 cm deep. Scatter pea seeds along the drill or space these evenly about 20 or 30 pea seeds per meter of row in single or double lines. Cover with soil using a rake to draw it over them. Do not sow in wet or poorly cultivated soil but wait a week or two until the soil dries. Pea tends to rot in cold,

wet soils. Timely sowing is essential for optimum yields. Late sown crops are often affected by low moisture availability and heavy aphid infestation at medium altitudes and by frost at high altitudes. Below are planting and harvesting dates:

Type	Sow	Harvest	Sowing to Harvest (weeks)
First early	March to June	June to September	12
Second early	March to June	June to October	14
Main crop	March to June	July to October	15

Spacing

Pea is sown rather densely, with plant densities up to 80 plants per square meter. The seed should be sown 4 to 7 cm deep. Approximately 60 to 200 kg/ha of seed is required, with the highest rate of garden pea. Another important step to consider is to plant pea 3 to 5 cm deep

apart in single or double rows. Allow 46 to 60 cm between single or paired rows. Allows 20 to 25 cm between double rows.

The peas can be sown directly into the garden as soon as the soil can be worked about five weeks before the last expected frost. Place the seeds about 3 cm deep, about 10 cm apart into rows that are about 1 m apart. For correct row spacing, a string can be used as guide (pulled tense from one end of the row to the other end).

Building a small fence with chicken wire, or using climbing guides is also an important step for vining varieties. This is done by guiding the young plants towards the support structure as soon as they start developing long enough shoots to climb.

This keeps the vines free of dirt and too much moisture, which can cause the pea plants to rot. Water the peas after planting and keep them moist. Excessively wet conditions are not healthy for pea production. When the plants start to grow, some extra water is essential because the plant needs more moisture at this stage. The pea will be ready for harvest in about three weeks after

the first few flowers.

Fertilisation

For a good crop, apply about 500 kg per hectare of basal compound C (5:15:12) fertiliser. The crop should be top dressed at first pod set with potassium nitrate (13:0:46). Apart from application of fertilisers and manures, it is essential to treat the seed with Rhizobium inoculum for better nodulation, plant vigour and high grain yields.

Irrigation

The water requirement of peas is comparatively low. Pre-sowing irrigation is essential for proper germination if the soil is dry. The frequency of irrigation depends on the type of soil and winter showers. Generally two to three irrigation intervals are required. Soil moisture deficit reduces growth and hampers nodulation. Frequent irrigation should always be avoided (as excess moisture results in yellowing crop, reducing the yield) but the crop must be provided with irrigation at the pod filling stage and when frost is expected during the growth period. Furrow irrigation is used generally for irrigating pea but the sprinkler irrigation method is better.

Moisture stress during flowering and pod filling severely limits yield and quality of pods.

Weed control

Weeds should be rigorously controlled. The critical period of weed competition is 3 to 8 weeks after emergence. The pea crop severely suffers because of weed growth at the early stages. This might be the result of widespread spacing given for hand picking of green pods or for slow growth of pea during the early stage. Later the crop smothers the weed growth by covering the ground.

Generally two to three weedings are necessary to keep the field free from weeds. Manual weeding is better than mechanical weeding to avoid damage to the root systems. Weeding at a later stage is avoided as it may also damage the crop by trampling and mechanical breakage of tender and succulent stems and branches. Weeds can be controlled by hand-weeding where labour is cheap, whereas chemical weed control is more practical in large-scale production

Pest control

Leaf weevil (*Sitona lineatus*)

The pea leaf weevil

(*Sitona lineatus*) is an insect that damages peas and other legumes. It is native to Europe but has spread to other areas. The weevil is about 3.5 mm to 5 mm long and distinguishable by three light coloured stripes running length-wise down the thorax. The weevil larvae feed on the root nodules of pea plants, which are essential to the plant supply of nitrogen, and therefore diminish leaf and stem growth. Adult weevils feed on the leaves and create a notched “c shaped” appearance on the outside of the leaves.

Pea weevils thrive and damage plants under cool, wet conditions and become less of a problem as the weather warms up. Check emerging pea plantings by examining plants and rolling over dirt clods where adults may be hiding. Cone traps with aggregation pheromone can also be used. Economic damage can occur at densities as low as 33% adult weevils per seedling plant. Consider 25% growth point injury on seedling plants an action threshold. Crop rotation and planting peas away from other legumes is useful. Irrigation and proper fertilisation may help crops outgrow defoliation.



Pod borers (*Etiella zinzenella* and *Helicoverpa armigera*)

The moths are medium sized with a wingspan of 2.5 cm and wing colour is grey with dark marginal lines interspersed with ochreous scales on the forewings. The early larvae are greenish and the full grown ones are rosy with a purplish tinge. The caterpillars enter the pods and feed on the seeds. The caterpillars also consume the flowers. Consumed flowers and holes on the pods are the characteristics of the presence of this pest. Deep ploughing is likely to kill the diapausing pupae. The pest population can be kept under control by spraying a botanic pesticide prepared from neem seed.

Leaf miner (*Phytomyza atricornis*)

Leaf miner is a small insect with a large globular head and black thorax having yellow markings on the sides. It is a major polyphagous pest of pea. Adult insects puncture the leaf either to lay eggs or to feed on the plant sap while the larvae feed on the leaf tissue as they mine. A series of triangular blotches in which eggs are deposited or irregular mined areas the visible symptoms of attack by this pest.

Cultural control can be achieved by removing and destroying the infested leaves which are identified by the mined areas and blotches.

The maggots of this pest are parasitized by the

A healthy pea crop

hymenopteran *Solenotus* sp, and *Neochrysocharis* sp and *Opius* sp which allows for biological control.

Aphids

Aphids are found on new stems and the underside of the leaf. They are usually green. They suck fluids from the plant, leaving a honey dew substance behind. Leaves turn pale yellow.

Aphid control can be achieved using insecticide sprays with products such as Dimethoate 40 EC, or a strong stream of water. Ladybird beetles are natural predators. Also a layer of Alumnum foil under the plants reflects light to the underside of leaves and may deter aphids.

Cutworms

Cutworms chew off plants just above the ground level. Cutworms are caterpillars that are up to 3 cm long and moulted or striped green, brown or grey. When they are disturbed they roll up or coil. They usually position themselves at the moisture line in the soil, moving up and down according to the water content. If the surface soil is dry, they will be found a couple of centimetres below the soil surface. Cutworms can be controlled by spraying with

Lamda-cyhalothrin 5 EC soon after seedling emergence.

Slugs and snails

Slugs and snails damage young plants resulting in poor stands. Slugs and snails are very susceptible to desiccation (drying) and require a moist, shady place to live.

Cultural practises which promote a sunny and dry environment will discourage them. Avoid too frequent watering, and allow the soil surface to dry out between irrigations. Keep the garden free from debris, boards, bricks, and stones where they hide. Hand picking these pests is very effective. Create traps for hand picking or laying boards in the garden.

Slugs and snails will congregate under them. Lift the boards each morning and collect the slugs and snails.

Dispose of them completely as they will crawl back if tossed out of the garden, and eggs inside can still hatch to produce more of these pests. Slug and snail baits containing metaldehyde can be placed near food plants as they do not contact edible portions of the crop. It is most effective when moistened, but not waterlogged. Snail bait attracts slugs and snails from several metres away so bait stations are effective. Stations help

protect birds, pets and other non-target animals which are also attracted to the bait.

Place small piles of bait under a slightly propped up board or use a container such as a cottage cheese or yogurt carton. Bury the carton to the mouth of the container. Place a small quantity of commercial bait inside and moisten with apple juice, orange juice, or water. Cut a hole in the lid to allow access and place lid on container. Containers may also hold beer or yeast water to attract slugs and snails in, where they drown. Place bait stations wherever slugs and snails are active or around the perimeter of the garden.

Disease Control

Wilt (*Fusarium oxysporum* f. sp. *psii*)

Plants that are infected become stunted, pale-yellow green with leaves curled downwards. The stems become thickened and brittle at ground level. As a result, the plants wilt and die off prematurely. The disease may cause more or less circular bare spots in the field, enlarging each year if peas are planted continuously. The disease is favoured by high soil moisture.

Control measures:
Select wilt-resistant varieties.

Avoid early sowing to escape high humidity and high temperature conditions which favour the disease. Crop rotations for at least two to three years with suitable non-leguminous crops.

Powdery mildew (Erysiphe psis)

The disease occurs worldwide and is much more serious than other diseases because it occurs more frequently and covers a large host surface area. It is worst in dry weather. Early varieties are less damaged. Varieties maturing in January usually escape the maximum intensity of the disease.

This disease is characterised by small lesions that appear on the upper surface of the lowest and older leaves. These lesions are scattered on the leaves and as they mature and develop they look like white, powdery areas. Severely infected areas may even look blue – white. The powdery mildew first appears on the leaves and then on other green parts of the plant. Its attack is characterised by the formation of white, floury patches on both sides of the leaf as well as on tendrils, pods and stems. These patches originate as minute discoloured specks from which a powdery mass radiates on all sides. When the disease has advanced, large areas on the aerial parts of the host may be covered with these white, floury patches. The

superficial mass consists of mycelium and spores of the fungus causing the disease.

Control measures:
Fungicides: Wettable sulphur, or Orius 250 EW. Spray at 7-14 day intervals.

Burn infected pea stubble soon after harvest where practicable.

Avoid late sowing of the crop.

Avoid sowing field pea crops adjacent to last season's stubble.

Control volunteer field peas which can harbour the disease.

Leave four years between field pea crops.

Use treated seed.

Also, planting early using sprinkler irrigation will minimise the chances of having a crop infected with powdery mildew.

Several fungi such as *Ampelomyces*, *Cladosporium*, *Tilleiopsis*, *Verticillium* and insects (*Thrips tabaci*) have been reported to parasitise the powdery mildew on the host surface.

Downy Mildew (Peronospora pisi Syd)

This disease is characterised by stunted and distorted plants with fungus growing on all the plant surfaces.

These plants may turn yellow while producing more fungi for secondary infections. The plant will develop lesions that are greenish, yellow to brown in colour on the upper leaf surfaces and mouse grey, fluffy areas on the undersides of the leaves.

Control measures:

Fungicide: Dithane M 45. High volume spray at 7-10 day intervals.

Use resistant cultivars.

Crop rotation for at least 2 to 3 years helps in reducing the primary inoculum.

Diseased plants should be removed and burnt soon after detection in the field.

Rust (Uromyces sp)

Two species of *Uromyces* occur on cultivated pea, *Uromyces pisi* and *U. fabae*. Destroy all diseased plant debris after harvest.

Follow a suitable crop rotation with non-leguminous crops.

Fusarium wilt

Causes yellowing of lower leaves, stunted growth, wilting, and eventually death.

Control measures:

Pull up and destroy infected plants.

Crop rotations.

Use disease-resistant varieties.

Aphanomyces root rot

The disease is characterised by firm, straw coloured lesions that are found on the roots. The lesions spread through the cortex and eventually develop a discoloured root system. The disease can be visible one to two weeks after the infections occur. The best form of control is to check fields before planting and avoid infested fields. There are no resistant cultivars.

Leaf roll virus

This disease is characterised by plant distortion, when the plant is still young. As the plant grows and matures, it may take on symptoms of stunted plant growth, yellow spots, leaf and pod distortion, and reduced seed size and quality. The best form of control is to use resistant cultivars.

Pea seed-borne mosaic

Affected area-entire plant
This disease is characterised by stunted and malformed plants that may also never reach maturity. The disease can affect the entire plant. The best form of control is use resistant cultivars.

Pea stunt

The disease kills off young plants early before they get a chance to bloom. As the plant becomes older, the infections will cause stunted growth and terminal rotting. The best form of control is to use resistant cultivars.

Seedling rot *Rhizoctania solani*

This disease affects the seed and is characterised by lesions that appear to be water-soaked as the seedling emerges. These lesions will develop a reddish-brown to brown colour and often the growth point may be affected, causing it to die off. Mature plants that become infected will also develop the reddish brown, sunken lesions that may girdle the plant and cause severe stunting.

The best form of control is to apply fungicidal seed treatment chemicals (e.g. Thiram 80 WP. Please visit the Windmill website and see the 1 hectare sheet (www.windmill.co.zw).

Trellising

Trellises permit plant foliage to dry out, reducing the threat of mildew and other fungal diseases. Single trellis rows are usually spaced 2 m apart, because this is the smallest spacing that will still accommodate a tractor for spraying and cultivation.

The germinating seeds and small seedlings are easily damaged by direct contact with fertiliser or improper cultivation. Cultivate and hoe shallowly during the early stages of growth. Most Dwarf and intermediate varieties are self-supporting. The taller varieties are most productive and more easily picked when trained to poles or to a fence for support, but they are no longer popular. Peas can be mulched to cool the soil, reduce moisture loss and keep down soil rots. Some of the snap and sugar peas are vining types with heights of 2 m or more that require fencing or other supports.

Garden pea is seldom supported. The stems are not twining, but grasp the support with their tendrils. They do not need vertical poles, but the poles can be

crossed, or the plants are supported by wire mesh, horizontal wires, vertical lattices or nets, depending on their potential height of the cultivar grown.

Integrated pest management

To control insect pests and diseases, integrated pest management (IPM) is recommended.

Use disease free seed or seed treatment of own seed, keeping fields weed-free.

Appropriate fertilization and irrigation.

Regular monitoring of the crop, and judicious use of biocides.

Harvesting

The harvesting period is 58-74 days depending on variety and growing conditions (soil temperatures, and moisture). Pick garden peas when pods are round (swollen) and full. Pick a few pods every day or two near harvest time to determine if the peas are at the proper stage for eating. Peas have the best quality when they are fully expanded but immature, before they become hard and starchy. The last harvest (usually the third) is made about one week after the first harvest. Pulling the entire plant for the last harvest makes picking easier. The smooth seeded varieties tend to have more starch than the wrinkle-seeded varieties. The wrinkle-seeded varieties are generally

sweeter and usually preferred for home use. The smooth seeded types are used more often to produce ripe seeds that are used like dry beans and to make split pea soup. Snap peas have been developed from garden peas to have low fibre pods that can be snapped and eaten along with immature peas inside. Snow peas are meant to be harvested as flat, tender pods before the seed inside develop at all.

Harvesting methods

Peas should be picked immediately before cooking because their quality, especially sweetness, deteriorates rapidly. The pods on the lower part of the plant mature earliest. The pods are plucked manually from the plants and harvesting may be done at weekly intervals. Peas can be picked as soon as they are big enough. Picking the first pods when the peas are relatively small helps maintain quality. Early picking also helps to extend flowering and cropping by preventing seed setting. Once a few pods set, the plant puts all its energy into swelling these. All the pods should have reached readiness when picking starts.

Harvesting recommendations

Shell type and snap type: pick when pods are full, but not swollen. Large peas are

tough and less sweet. Edible pod: pick before there is no seed inside the pod. Harvesting the peas every 3 to 5 days will prevent over maturity and stimulate the plants to continue to produce new pods. Harvested peas should be rapidly cooled to 0 °C to 1 °C. Optimum storage conditions are between 0 °C to 2 °C, and 90% to 98% relative humidity.



Broccoli Production Guide

Prime Seedco

General

Broccoli is a vegetable rich in vitamin C, protein, fiber and flavor. It is also known as a “Super Food”. Broccoli belongs to the “Brassica – Genus” closely related to Cabbage, Brussels sprouts and Cauliflower.

Broccoli types are, Large headed varieties, Sprouting varieties and Romanesco varieties. Large headed are the standard type with heads weighing from 400grams up 850 grams. Sprouting broccoli like Purple Sprouting and Green sprouting broccoli produces numerous heads on long stalks and Romanesco varieties produce elegantly swirled heads composed of symmetrically pointed spirals. These large plants

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need plenty of growing space.

The Broccoli is grown during the cool weather conditions of winter. During the hot, wet conditions of summer the head sizes tend to be smaller. Consult a Seed Co Agronomist on which are the best varieties for winter and summer production. Broccoli is easier to grow than its relatives Cauliflower and Brussels sprouts and can produce bountiful crops. Broccoli is always in high demand on the dinner table.

Site Selection

Broccoli grows very well in medium to medium heavy clay loam soils with good water holding capacity. It can be grown however in more sandier soils but will require more frequent irrigations and higher fertilizer rates. PH levels should be from 5.8 – 6.5 as broccoli likes to have an alkaline soil. Broccoli responds very well to compost and organic enriched soils. Levels round 25 – 35 tons per hectare of well- prepared compost or farmyard manure will benefit the crop and help reduce the levels of costly fertilizers. Make sure compost and manure are well broken down when put in the fields or root burn may occur.

....continued on page 27



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Chicken litter can also be used at 2 – 5 tons per hectare but must be well composted. If ploughing, plough to a depth of 30 – 35cm which will make sure that the soil is prepared for good root development, but make sure any old plough pan is broken up. If ripping, then discing is preferred to prepare a fine tilth. The soil should not be too cloddy, also not too fine. During winter months, if possible, plant on North facing slopes to achieve better soil warmth.

Spacing

If planting on beds which are at 1.5m center to center the in row should be 30cm apart and two rows placed on the bed 50 – 60cm apart. This should give approximately 44,000 plants per hectare. Planting on the flat, rows can be 40cm apart and in row of 35cm apart. Higher plant populations give smaller heads so populations should be governed by market requirements.

Fertilizer

Broccoli can be susceptible to hollow stem problems caused by a Boron deficiency. If there is a Boron deficiency in the soil, apply Solubor



as a foliar spray every 2 weeks at a rate of 10grams/ 1 liter of water. A balanced Basal type fertilizer of either "A" "B" or "C" should be applied before planting. A vicon spreader can be used to broadcast the fertilizer on the flat or a ridger type applicator to apply the fertilizer if the crop is to be grown on beds. Cupping with fertilizer cups by hand into the pre-marked planting holes can also be done but the fertilizer must be well mixed in the hole with the soil to prevent root burn.

Based on soil analysis results, the rates of fertilizer can be adjusted to the rate to be applied and if compost or manure have been applied the rate can also be reduced. Fertilizer rates of 500kg – 750kg per hectare can be applied. Broccoli requires around 400kg per hectare of A.N. split into 3 applications from 3 weeks up to 6 weeks after transplanting. If the crop is being planted

on sandier soils and during the rainy season, extra top dressings might be required after heavy leaching rains. Plantings going into mid-winter should be top dressed with Calcium Nitrate, instead of A.N. as it works quicker in cool soils.

Seedlings

Planting with seedlings is the most practical method. Use a recognized nursery where strong and healthy seedlings are produced. Transplanting good seedlings this gives a base for a more uniform crop, which reduces costs at harvest time. Order around 10% more seedlings for your selected plant population from the nursery to ensure best seedling selection when transplanting. When using seedlings or speedlings as they are most commonly known, at transplanting make sure that good plug to soil contact is made so the root system

Higher plant populations give smaller heads so populations should be governed by market requirements.

can leave the plug and quickly enter the soil enriched with either fertilizer or compost. Plant the speedlings as soon as possible after collecting them from the nursery to avoid the tiny hair roots from drying out. Plant the plugs/speedlings into pre-irrigated soils in which the field has been brought up to field capacity. After transplanting a light settling-in irrigation is required to remove tiny air pockets between the plug and the soil.

Varieties

Selection of a variety depends if it is to be marketed as fresh or frozen. Broccoli is usually a cool weather crop but can be grown year-round with correct variety selection, this is where your Seed Co Agronomist can advise. Seed Co has a range of well adapted broccoli hybrid varieties including Cigno F1, Formoso F1, Montop F1 and a summer variety called Corato F1.

Broccoli is quite frost tolerant. There are two types, heading and sprouting. Sometimes selected varieties might produce side shoots once the main head has been harvested. Variety selection will also have maturity dates varying from 60 – 75 days.

Harvesting

Time of harvest is primarily determined by the tightness of the florets and not by the size of the head. The head should be firm and compact, not opening and loose. If leafy points have come through the head before harvesting it shows harvesting is late, or the plant has been under stress. This is more common in hot summer weather conditions when head size is generally smaller than in winter production. When harvesting cut the central stalk at a 45-degree angle, 13 – 20cm below the head. This will keep water from pooling inside the cut stem and causing rot.

Broccoli has a poor shelf life at ambient temperatures so the harvested heads will require cold storage or to be delivered to the fresh market in the shortest possible time. Brown or Purple beads is a physiological problem that is more prevalent under hot humid conditions.

Irrigation

Regular water applications during the dry winter months is essential. Overhead irrigation or center pivot irrigation is the most common followed by flood and more recently drip irrigation,

which is becoming more affordable. Broccoli like cauliflower, the irrigations must be spot on or “Hollow stem” will occur due to fluctuations of water levels in the soil. Approximately 600mm – 750mm of irrigation should be allowed to produce a quality Broccoli crop.

Therefore, planning water usage from dams, rivers and boreholes can be worked out to match hectares to be planted. As the plant increases in size and leaf area, and the head starts to form, the amount of water required also increases. Irrigation should be planned on a weekly basis and the soil depletion area checked regularly to plan for the next irrigation cycle.

A quick test is to take a fist full of soil in your hand, squeeze it to form a ball then tap the “ball” with your finger, if it collapses it is becoming dry and irrigation should be applied immediately. Preferably it should not have gone as far as this stage. The use of an evaporation pan should help with scheduling.

Rotations

In rotation planning do not follow with Broccoli if the previous crop has been a Brassica type i.e. Cabbage, Cauliflower

or Rape. Always rotate with a legume or root crop.

Spray Guide

syngenta Broccoli Spray Guide

Stage	Nursery	Transplanting & Establishment	Rapid Leaf Growth	Floret Formation	Floret / Head Expansion	Harvest
Days:	0-30	30-35	40-60	50-70	65-90	90-130
Pest Problems						
Soil Pests & Aphids		Actara Soil drench or Dip				
Cutworms		Karate Zeon / Ampigo				
Diamond back Moth			Ampigo / Match / Karate Zeon/ Proclaim			
General Caterpillars				Ampigo / Match / Karate Zeon/ Proclaim		
Aphids & Whitefly		Actara Soil drench				
Disease Problems						
Damping off & Black Leg	Apron Star / Score					
Bacterial Black Rot			Bion / Copper Oxy			
Downy Mildew		Bravo / Ortiva / Bravo				
Club Root		Quiltozene				
Alternaria, Powdery Mildew, White Blister & Ring Spot				Bravo / Ortiva / Score		
Weed Problems						
Before planting - post emergence perennials		Touchdown				
Before planting - post emergence annuals		Gramoxone / Touchdown				
Pre-emergence: grasses			Dual Magnum			
Post-emergence: grasses				Fusilade Forte		

Agrochemical	Rate/ha	grams or ml/100 Lts water @ 500 Lts water/ha	EU MRL mg/kg	Days to Harvest (ph)
Actara 25 WG drench	500gm	5 g/l.5Lts water/100m	0.2	n/a
Actara 25 WG foliar spray	250gm	50	0.2	7
Karate Zeon 5CS	100ml/ha (cutworm) 200ml/ha (bollworm)	20/40	0.1	2
Proclaim 055G	250gm	50	0.01	2
Ampigo 150ZC	250ml	50	1	3
Match 050 EC	600ml	120	0.2	14
Polo 500SC	600ml	120	0.1	3
Apron Star	2.5gm/kg seed		Seed Dress	At Planting
Copper Oxychloride	3kg	600	20	2
Bion 50 WG	30-60gm	6-12	0.02	14
Amistar op 325 SC	750-800 ml	150-160	1	21
Revus	500ml	100	2	2
T Folia Gold	2Lts	400	0.2	7
Bravo 720 SC	1.4 Lts	250	5	7
Ortiva 250 SC	500-600 ml	100-120	5	14
Dual Magnum 960 EC	1.25 Lts	250	0.05	n/a
Fusilade Forte	1 Lt	200	0.2	28
Gramoxone	2 Lts	400	0.02	na
Touchdown	2lts	400	0.1	na



Demystifying Cattle Fattening

Beef fattening in Zimbabwe has financial rewards if done correctly. This article serves to give you guidance on how best to it. Beef prices normally changes with season and higher prices are realized for good grades during the dry season when most animals are in a deteriorating condition.

The choice of reconditioning and adding some weight of the animal during a short period normally pays off when done properly.

This involves the feeding of cattle on high-energy diet and adequate protein for a period of 90 to 120 days. Feeding is done under confinement to prevent loss of energy

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through movement. Pen fattening is done for three basic reasons:

1. To increase the mass of the animal for slaughter at a younger age and thereby increase turnover maximising output from beef enterprise.
2. To improve the degree of fatness and fleshing of an animal and so achieve higher grades at a younger age.
3. To take advantage of seasonal high prices. Pen fattening enables the animals to express fully their genetic potential for growth. It also enables the profitability of beef production to be maximised, provided the beef price to feed cost ratio is favourable.

The basic principles of pen fattening

Energy consumed in excess of maintenance requirements is used for tissue synthesis (beef production). The efficiency of use of the energy above maintenance for tissue synthesis remains constant. Thus, the greater the intake of energy above maintenance the smaller the maintenance cost per unit gain and the cheaper the gain. Generally as the digestibility of feed increases, so does the voluntary feed intake up to certain limits. The combined effects of high digestibility and high intake, together with higher net efficiency, means the efficiency of use of energy will be greater if cattle are fed ad lib with diets of

high digestibility or a high level of metabolisable energy (ME). Total feed consumed, net digestive efficiency, cost per unit of feed and return per kilogram of meat sold, other management costs and the optimum length of the feeding period determines margins realised.

Feed

Energy levels and sources

The energy level of the diet should be as high as economically possible. Ideally it must be in the region of 70 to 80 % Total Digestible nutrient (TDN) (10.5 to 12 MJME/kg on dry matter basis).

Maize is the most commonly used source of energy in this country. For convenience and to provide roughage, it is fed in the form of snap corn containing 75 to 83 % grain. Generally, the performance of animals on diets containing different energy feeds will be closely related to the energy content of the diets assuming it is correctly balanced in other respects. Sorghum can be used and taken to be 89 % maize value. The white varieties are better than the reds.

The choice of the feed should be dictated by performance in relation to cost. For some feeds the



quantities to be included in the diet must be restricted. Feeds containing high levels of oils such as cottonseed, sunflower and germ meal need to be restricted so that the oil content of the diet does not exceed 7%.

Feed grade wheat should not exceed 50% of the diet to avoid digestive disorders and reduction in intake. Molasses, which can improve the palatability and stability of the mixtures, should not exceed about 55% of the diet. It is usually included at 30 % of the diet. The value of silage in fattening diets is largely determined by the amount of grain in the silage. It should be noted that silage in pen fattening diets have an influence on protein and energy addition and if well balanced this can reduce costs significantly.

Roughage levels and sources.

Although efficiency of energy use increases with increasing energy concentration, digestive disorders occur and efficiency declines if the diet contains inadequate roughage. A minimum of 15 to 20 % roughage should be included in the diet. This equates to 7 to 14 % crude fibre depending on types of concentrates and roughage used.

A wide range of roughages are suitable for inclusion in high-energy diets. These include maize sheath, cobs and stover, silage, grass and legume hay, cottonseed hulls groundnut hulls and sunflower hulls. While less important than the concentrate portion of the diet, the palatability and nutritive value of the roughage can affect feed intake, rate of gain and efficiency of feed utilization.

Cottonseed hulls groundnut hulls and sunflower hulls and roughage substitutes such as sawdust and

The choice of reconditioning and adding some weight of the animal during a short period normally pays off when done properly.

paper products generally give below average results. Jack beans and soybeans hays contain the enzyme called urease, which quickly break down urea to its products and may result in urea poisoning.

Protein content and sources

The protein content should be 12 to 13 % crude protein (CP). This level supplies in excess of normal animal requirements values, but it is desirable in order to promote maximum feed intake and efficiency. The protein can be divided into Natural protein and Non-protein Nitrogen (NPN). Generally the two should be mixed for economic reasons. The natural protein concentrates used in Zimbabwe are Cottonseed meal/cake, soyabean seed cake /meal, sunflower seed meal /cake, groundnut meal /cake, blood meal, meat-meal and fishmeal. This is the expensive form of protein given to animals. The majority of pen fattening rations urea inclusion is 2 % of the total ration. This is fed as feed grade urea and weight gains based on urea peaks up later but is more economic than natural protein.

Other nutrients



The diet should be well balanced for calcium and phosphorus at correct levels. Diets based on most energy feeds other than molasses will be deficient of calcium and limestone flour needs to be included

Excessive amount of phosphorus can adversely affect the use of other minerals and increase incidences of urinary calculi. Diets containing 70 % or more of grain or grain by products usually contain adequate P and there is no need to add more. But if such feedstuffs like molasses or silage or orange pulp make up a large proportion of the diet, additional P, in form of MCP or bone meal will need to be added. Ruminants can tolerate a wide range of Ca: P ratio than monogastrics but extremes result in reduced performance.

The ratio less than 1:1 or more than 7:1 should be avoided. Undesirably low levels are most likely in diets based on grains and grain by products and it may be necessary to increase calcium levels well above requirements to improve the ration.

Vitamins

Diets with no sources of vitamin A should have an additional 3million I.U of vitamin A added per tonne. No other added vitamins should be necessary in this country.

Fats

Fats can be added to increase the energy content of the diets and to reduce dustiness. The total fat in the diet should not exceed 7 % otherwise feed intake may be de-

The choice of the feed should be dictated by performance in relation to cost.

pressed. If protected fats are used the fat content may be increased to 10 % (Not unsaturated fats). Fat should not be used as grain substitute and where unsaturated fats are used rancidity will be a problem.

Physical form of diet

Maize is usually coarsely milled in order to produce a consistent mixture with the protein concentrate. Whole maize can be fed without loss in efficiency provided the protein concentrate is pelleted or molasses based to prevent separation. When whole maize is fed, roughage is fed separately unless it is incorporated in the pellets. With a period of adaptation the roughage can be reduced to very low levels or even removed completely. Small grains like sorghum are best coarsely milled or cracked. Roughage can be fed unmilled when it is fed free choice but it has to be milled for inclusion in complete diets. In this case particle size should be about 10 to 20 mm, which usually requires a screen size of 12 to 25 mm, depending on the mill design and speed.

Feed additives and supplements

Various additives and implants have been shown

to improve the efficiency of feed conversion and can be used to improve the economics of pen fattening. These are:

Nutritional supplements (e.g. Nubo and Rumicell). These usually are administered as boluses or feed additives orally. They have an advantage of adjusting rumen flora and promoting beneficial microbes in the rumen after dosing. This increase feed efficiency and improve profitability.

Lonophores (e.g. monensin, lasolocid). These improve the efficiency of energy absorption, and reduce incidences of acidosis and bloat. Monensin tends to reduce intake while gains remain unaffected, while lasolocid has less effect on intake but increase gains.

Feed intake

This is the most important factor affecting the rate of gain and efficiency of feed conversion. Intake varies with the mass of the animal, the type of diet and the stage of the feeding period. On low energy diets intake is controlled by gut fill and is usually of the order of 2.5% of the body mass or less.

As energy increases with decreasing roughage levels intake increases reaching a peak with

diets of about 20 to 30% roughage. With further increases in energy concentration, intake decreases tending to be controlled to a constant energy intake. The average DMI over a feeding period for yearlings on a standard 20% roughage maize based diet is 2.8% this figure may increase to about 3.3% if the ration is particularly palatable or if maize is replaced with an energy source with less energy. Intake usually starts at relatively low level, increases for a while and then levels off or slowly declines. Yearlings and 2.5 year olds on a 20 % roughage usually consume 2.5% of their body mass initially increasing to about 3.2 to 3.5% at 6 to 8 weeks, thereafter declining slowly or remaining fairly constant in absolute terms. Weaners take longer to reach peak intake (about 12 weeks) and show less decline thereafter.

The rate of gain and feed conversion ratio

The rate of gain of pen-fattened animals is dependent on the amount of intake and the energy concentration of the diet assuming it is correctly balanced in other nutrients. Gains on high energy diets of standard roughage content of 20% have been recorded at 1.2 to 1.6kg per day and the feed conversion ratio

(FCR) has a range of 7:1 to 8.5: 1 (Live mass) and 11.2: 1 to carcass mass. As the feeding period progresses the rate of gain decreases and the FCR deteriorates and a stage is reached where feeding costs equal and then exceed the value of gains.

they are sold at milk tooth. Breeds differ more in their daily voluntary feed intake than in their inherent efficiency of feed conversion.

By Claude Ndavambi

Type of animal

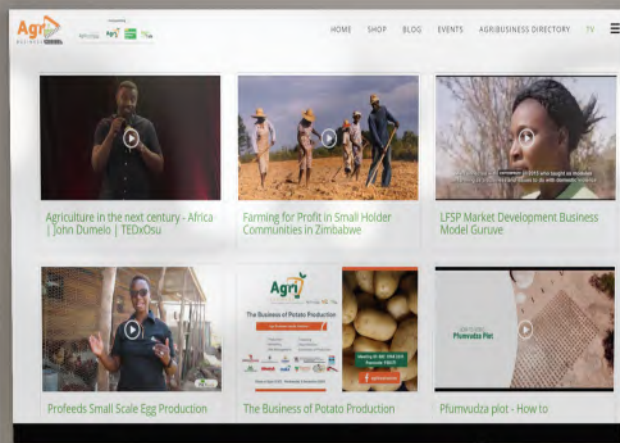
The age, sex, mass type and cost of animal are important considerations in pen fattening. Young animals usually convert more efficiently than older animals. But there are probably greater variation within an age group, according to type and condition, than between age groups. Animals in lean condition with good conformation are usually the most efficient and the price per kg is critical consideration in the economics of fattening. The maximum price payable must be carefully calculated. It is easy to make a financial loss before fattening even starts by paying too much for the animals.

Heifers consume slightly less feed than steers and are about 7 % less efficient. They finish sooner and their corresponding minimum mass should be approximately 10% less than for steers. Bulls and short scrotum bulls grow faster, are most efficient and grade better than steers. This is provided

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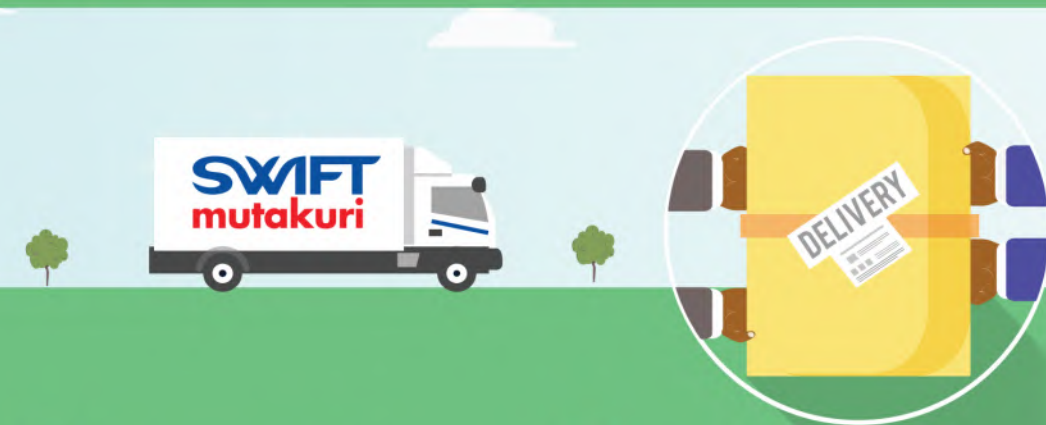
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5 Bales loaded by 18:00, and are shipped to Harare

6 Bales loaded in Harare by 06:00, and delivered to the floor by 07:00

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Meet the Farmer: Dadirai Mabaya



Goat Production: Feed Types

The natural rangeland is the basic forage resources for goats like all other ruminant livestock.

Goats are browsers and require a mixed diet (grasses, legumes, shrubs, tree leaves, crop residues and weed).

Being selective animals, goats will prefer to forage on the better parts of the plant (young shoots and fleshy leaves) and are able to eat and utilize certain plants or plant products that are not

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utilized by other livestock species.

Browse Species:

Goats feed on a number of wild and domestic browse species. The diet comprises fresh soft twigs, leaves and pods. Pods are good protein sources that can be collected and stored for supplementary feeding during the dry season.

- Acacia specie

- Mulberry
- Leucaena
- Grewia Monticola

Planted pastures/ Fodder crops:

Feed resources from planted pastures and cultivated grasses, legumes and crops include the following:

- Bana grass
- Star grass
- Kikuyu grass
- Sorghums
- Lablab
- Velvet bean
- Cowpeas
- Sweet potato vines

NB: These can be fed fresh or conserved as hay or silage. It is also recommended that these legumes should not exceed 25% of the total requirement per day.

animal's requirements, supplementary minerals in the form of commercial mineral mixtures should be provided.

Crop Residues

These include the following:

- Maize stover
- Groundnut Stover
- Sorghum Stover
- Sweet potato vines
- Banana peelings

Commercial Feeds:

These are feeds purchased from weed manufactures. They include goat meal or pellets which are formulated to provide to meet the animal's nutrient requirements. Always read the instruction provided by the manufacturer on how to use these feeds.

Mineral Salts:

Goats need mineral salts, mainly calcium and phosphorous for good bone and teeth development for reproduction and lactation for promoting appetite, immunity and weight gain and to improve hair coat appearance. Feeds provide some of mineral requirement but where these are inadequate to meet the



5 Tips for Effective Boer Goat Breeding

Buy a Pair

Goat breeding for Boers typically starts by buying the buck and does. Experts recommend that first-time breeders start with a ratio of 1 buck for about 20 to 30 does.

The quality of kids depends on a large part on the buck. This is the reason why champion bucks can cost several hundreds of dollars. When looking at bucks you're thinking of buying, check thoroughly before making a big

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investment. Make sure that the buck is not overweight. They need to visit all of the does, and that involves a lot of walking. Fat can also restrict the testicles and make it harder to produce sperm.

Does also need to be healthy to produce good offspring. If possible, choose one that has produced kids before. Check the records of the breeder to make

sure that they can produce and support multiple kids.

Check the Weight

Even though Boer does reach puberty earlier; that does not guarantee that they are ready for reproducing. Instead of age, breeders recommended monitoring the weight of the goats to make sure that they are ready.

Goat breeding too early can stunt the growth of the does. This can also cause problems such

as dystocia, which is when the kid cannot get out due to a small birth canal.

Compare the weight of the prospective dam to other does in the herd. If the weight is about 60% of a full-grown doe, they are ready to mate. Most boer goats reach this weight at 1 to 1 ½ years.

Don't Breed too Often

Boer goats are able to reproduce often. But frequent goat breeding (such as 3x in 2 years) can damage the health of the animal too much (especially since they tend to produce multiple kids).

Synchronize

Taking care of kids can be exhausting. One easy way to manage resources and time is to synchronize the breeding. This means timing mating so that all the does get pregnant and give birth at around the same time.

Flush the Does

This process increases the chances that the does can create multiple offspring. Flushing involves feeding the does the best pasture around 4 weeks before breeding season. This conditions their bodies to handle multiple offspring and increases ovulation rates.



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Crop Planting Calendar (Zimbabwe)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Beet Root												
Brinjal (egg plant)												
Broccoli												
Butternut												
Cabbage												
Carrots												
Cauliflower												
Chillies												
Green beans												
Green mealies												
Lettuce												
Marrow (baby)												
Onion												
Peas												
Peppers												
Potato												
Squash												
Squash (germ)												
Squash (marrow)												
Tomato												
Water melon												



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The Agribusiness Expert Answers



Q

How can I graft watermelons?

A

- Watermelon plants are grafted when they are 14–21 days old. In order for a successful graft union to form, the scion and rootstock plants must have similar stem diameters at the time of grafting so their vascular bundles can be aligned and in complete contact with one another.
- The scion and rootstock seedlings may not germinate or grow at the same rates, so it is important to conduct a preliminary test to determine their growth rates in your growing environment.
- Seed more plants than necessary so you have a greater selection when matching stem diameters. Also, it is rare to get 100% graft survival, so graft at least 20% more plants than needed.
- Water both rootstock and scion plants 12–24 hours before grafting. Do not water plants immediately before grafting, unless they are wilted. If reusing grafting clips, wash them in warm, soapy water, sterilize them by soaking for 1 minute in a 10% bleach solution, and rinse them under tap water.
- Allow the clips to air-dry before reuse. Use only clean, sharp razor blades for grafting, and wash your hands with antibacterial soap or hand gel, or use latex-type surgical gloves. While there are many tools that can be used for cutting

Word Search

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R	T	R	H	E	A	L	T	H	R	A	T	I	O
O	O	E	G	T	T	S	E	W	E	I	C	N	H
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M	N	F	A	E	E	P	R	O	F	I	T	H	R
M	S	C	G	T	S	T	R	E	L	I	O	R	B
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- LOSSES
- CONVERSION
- ORIENTATION
- NUTRITION
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Image Source: Dadirai Mabaya

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