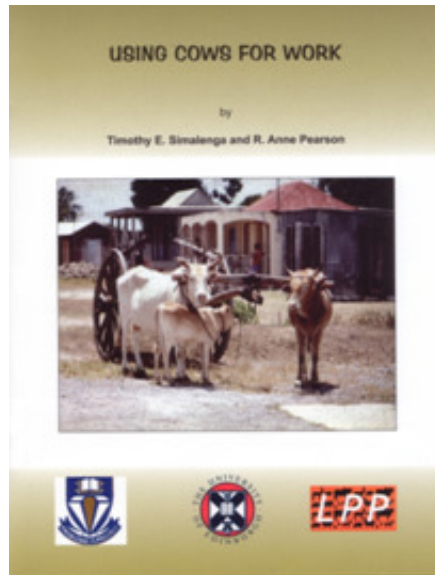


USING COWS FOR WORK



Timothy E. Simalenga¹ and R. Anne Pearson²

**1. Department of Agriculture and Rural Engineering,
University of Venda for Science and Technology,
South Africa**

**2. Centre for Tropical Veterinary Medicine,
University of Edinburgh, UK**

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Acknowledgements

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Front cover: A working cow in Guatemala photographed by Alex Morrow.

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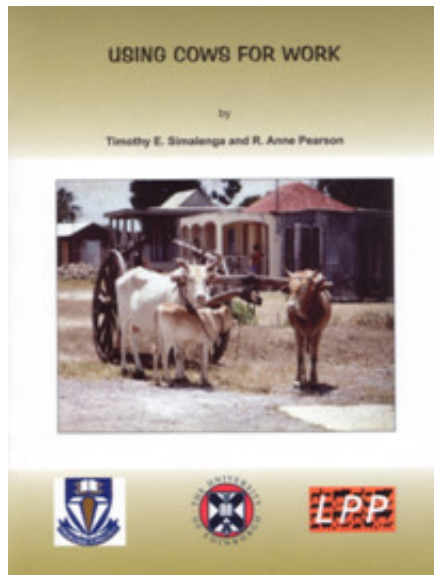
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**CTVM, University of Edinburgh, Easter Bush Veterinary Centre, Roslin,
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**Department of Agriculture and Rural Engineering, University of Venda for
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Introduction

Many people involved in farming on a small-scale in the world are mixed farmers. They keep a variety of livestock and grow food and some cash crops. When farming is

carried out on a small-scale on land areas of 1-4 ha it is often not economic to use motor power for land cultivation and cropping.

Because of this many small-scale farmers make use of animal power to supplement hand labour for their crop production and transport activities. Oxen are the most common animals kept for work in tropical and subtropical areas. Buffaloes, donkeys, horses and mules are also used where available and suitable. Although oxen and buffalo can be sold for meat at the end of their working life the donkeys, horses and mules have less value. Mixed farmers may also keep cows, for calf and/or milk production, goats and sheep alongside their working animals.

A smallholder farmer usually has limited feed resources available for livestock and may have different species in competition for the grazing and fodder available. Where communal grazing areas are declining or crop production is becoming more intensive then it becomes difficult to maintain a large number of animals productively.

For this reason many farmers are thinking about using their cows for work, either to supplement the draught power provided by their oxen or to replace it.

The aim of this booklet is to give some assistance to farmers thinking about using their cows for work. As a guide to extension workers and those likely to be discussing the issues with the farmers this booklet is written largely in the form of a series of questions. They are some of the questions most often asked by farmers thinking about using cows for work.

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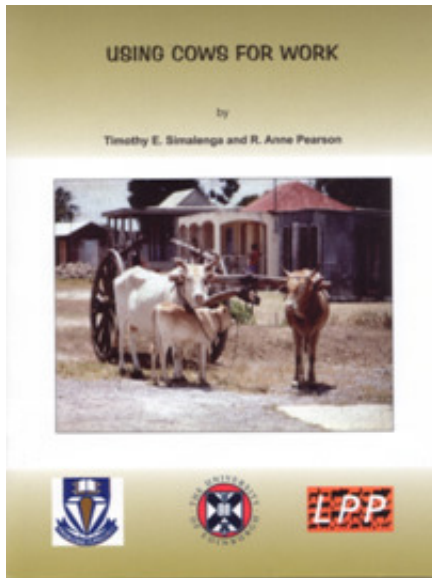
Why should I use cows for work

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Why should I use cows for work

What are the advantages of using cows for work?

A smaller herd is required if cows are replacing oxen for work

Male animals can be fattened more efficiently for meat and sold at a younger age if they are not needed for work

Feed to maintain work oxen is not needed, so feed can be used for other animals

Working females can produce their own replacements.

What are the disadvantages of using cows for work?

Cows are generally smaller and therefore less powerful than bulls or oxen

Working cows need more and better food to meet the requirements for work, reproduction and lactation

Work can reduce milk production

Work can reduce calving rate

Cows are not available for work for about one month before and one month after calving

If the cow dies or is stolen then draught power as well as milk and calf production are lost

Can I reduce the numbers of animals I keep on the farm if I use cows for work?

Yes. Provided you feed the cows well to maintain or increase their weight, cows can be used for work, so you would no longer need to keep oxen for work. Working cows can produce their own replacements. However if a cow dies or is stolen then draught power as well as milk and calf production are lost. This means that working cows need to be well-managed; they need good quality feed and health care.

What would I do with my male animals?

Male animals can be fattened more efficiently for meat and sold at a younger age if they are not needed for work.

Would I save on feed if I used cows for work?

Feed to maintain work oxen is not needed, so staple feeds and crop residues can be used for other animals.

Do I have to give my cow better food if it is working?

Yes. This is very important. Working cows need more and better food than working oxen, to meet the requirements for work, reproduction and lactation. When the cows are working they will have less time to eat and so this is another reason why they need better quality feed. Grazing and cereal crop residues are not enough. They need supplementation with preferably concentrate feed or green forage and industrial by-products.



Figure 1: Working cows in poor condition in Indonesia ; neither had produced a calf for four years .

Will my cow have a larger appetite if she works?

Yes, but on working days the cows will have less time for feeding than on non-working days so less food can be eaten. She may in the long term eat more feed than when not working, but it will not be enough to meet the extra feed needed for work so she will lose weight unless fed with better quality foods.

What food should I give my working cow?

She should be allowed to graze as long as possible and be given a supplement twice a day - before going out to graze and when being kraaled at night.

If the cow is kept in a stall with no access to grazing she should have access to cereal crop residues or hay all the time when not working.

Feed any supplement to working cows separately to avoid competition from other livestock. Offer the feed in a trough to prevent spillage/wastage. Any leftovers can be given to the other livestock later on. Give the working cows the first choice when feeding crop residues so they can select the best parts. Try and set aside a part of the crop land to grow some legume forage to supplement the working cows especially in late pregnancy and early lactation. Tree fodder and industrial by-products such as molasses and brewers grains are also good. Any feed that is rich in nitrogen and that is not bulky or slow to eat is also good for the working cow.

The best supplement is a concentrate feed. Although it is expensive it can be eaten in a short time. This is important if cows have to work and it contains the energy and protein that a working cow needs.

A concentrate feed which contains 25% crude protein and about 11 MJ metabolisable energy (ME)/kg dry matter should meet the requirements for work as well as milk production. Ideally the concentrate should be offered as a freely available supplement to the cows when they are not working so daily intake of concentrate is equivalent to about 1% of the animal's live weight:

Live weight (kg)	Intake of concentrate/day
500	5kg
400	4kg

300	3kg
200	2kg

This is in addition to the roughages she is getting.

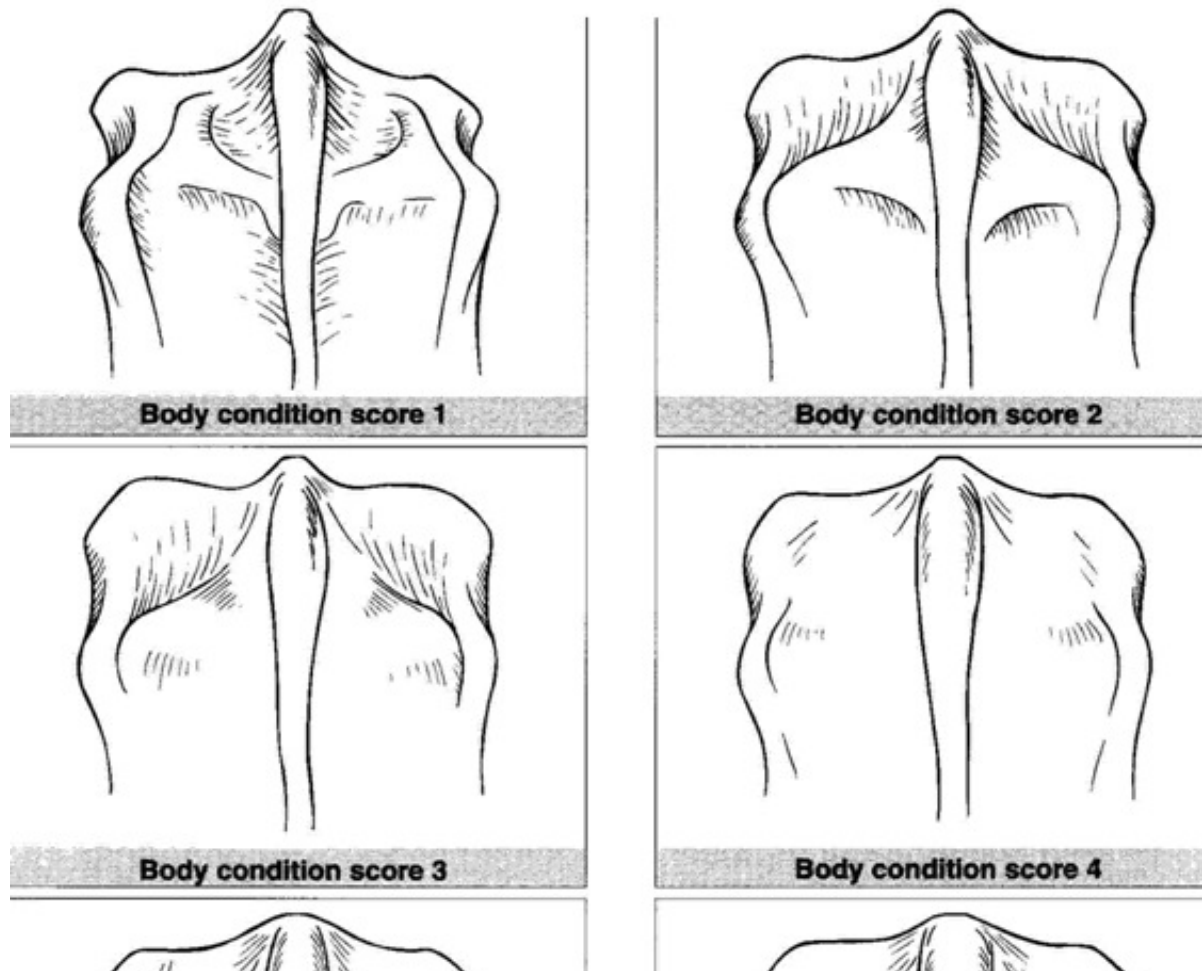
If it is not possible to have the supplementary feed freely available to the cows then the amount should be divided into two feeds and offered before work starts and about 1-2 hours after work has finished. This gives the animal time to cool down, drink and recover from the effects of work, especially important on a hot day.



Figure 2: Working cows need plenty of water, particularly if they are lactating.

How do I know if my cow is getting enough feed when she is working?

Your cow should be gaining weight while she is working especially if she is pregnant. Early in lactation she may lose weight, but the aim should be to regain the weight later in lactation. Otherwise it will be difficult to get the cow back in calf again. Her body condition should be monitored. She should have a body condition score in the range of from 5 to 7 (Figure 3), at the time you want her to conceive.



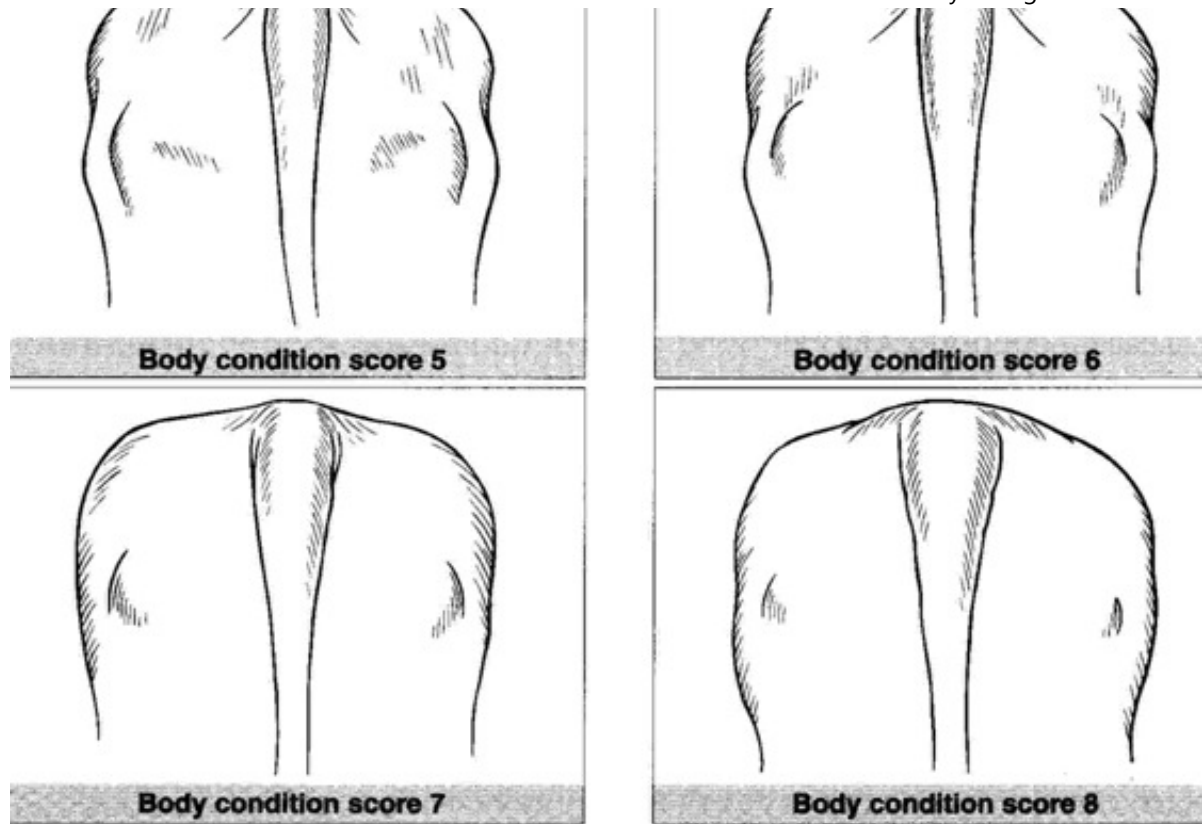
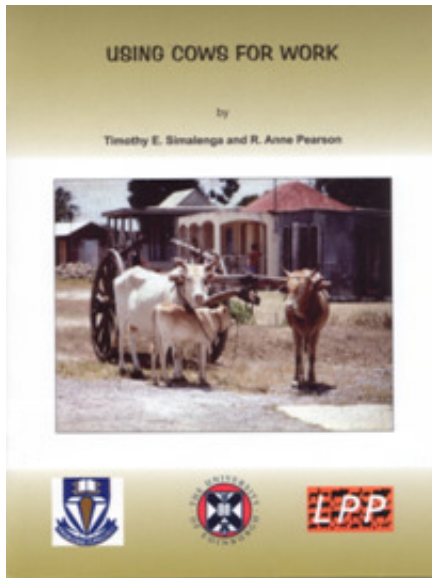


Figure 3. Body condition score of cows

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Can cows do the same amount of work as oxen?

Cows are usually smaller than oxen. As the amount of work or power that an animal can generate is dependent on its size, then cows will usually be able to pull less and work more slowly than oxen. If the cows are larger than the oxen, for example if they are crossbreeds, then they will be able to pull more or work more quickly. It depends on the size of the animals.

Can I work my cow when she is pregnant or lactating?

Yes, however cows should not be used for work about one month before and one month after calving. In late pregnancy cows are often too large to yoke together and too slow. After the calf is born the cow is producing a lot of milk

and can lose weight; working will increase the weight loss at this time and make it difficult to get the cow into calf again.

Does work affect milk production?

Yes. On the days that a cow works she will produce about 7-10% less milk than on days she does not work. Cows that are worked regularly can show a decrease in milk production of about 10% over a year compared with cows that do not work. This is due to a delay in conception and an increase in calving interval.



Fig. 4 Milking the working cow in West Africa

Does work affect calf production?

If a cow is in poor condition she will not conceive, so it is important that she is

fed well especially in late pregnancy and early lactation. This means she will come on heat soon after calving. If she is not fed well and is not in good condition, conception will be delayed and the interval between calving can become long. For crossbred cows in Ethiopia working regularly for 3 years, the calving interval was 100 days more than the calving interval of crossbred cows not used for work. As a rule of thumb lactating dairy cows will have a one-day delay in conception for each day of work.

Figure 5 shows the effect of body condition at calving and supplementation on the conception rate at 200 days of a cow used for work. If the cow is in good condition at calving, due to good feeding in pregnancy (body condition 5 or over; Figure 3) and/or is supplemented in lactation then the chances of her having conceived when checked at 200 days are high (over 80%). If she is in poor body condition (score less than 4; Figure 3) even if supplemented in lactation the chances of her being pregnant when checked at 200 days are low (under 20%).

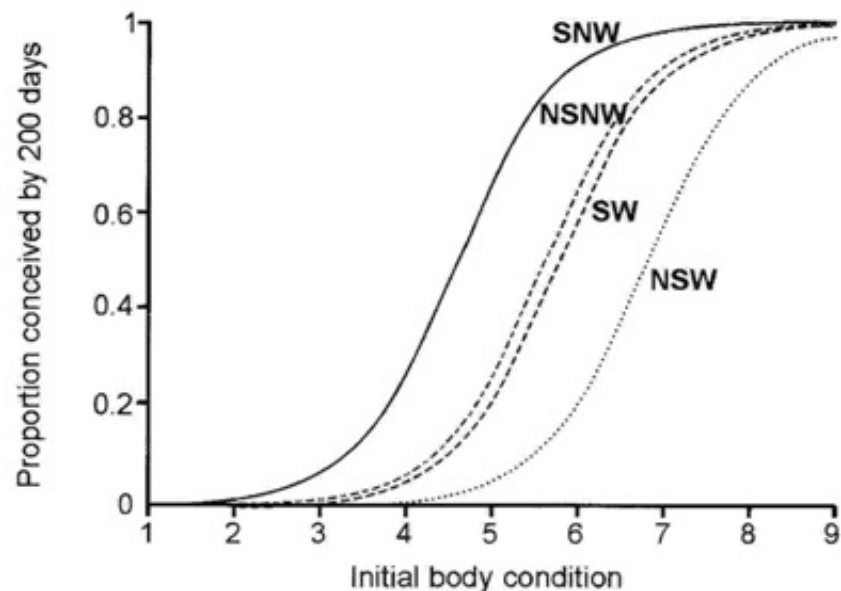


Fig. 5 Predicted chance of conception at 200 days post calving compared to body condition at calving - when cows are supplemented and do not work (SNW), supplemented and work (SW) and not supplemented and do not work (NSNW) and not supplemented and work (NSW).

I have some food but cannot afford to feed my working cow to maintain or gain weight in the year, what should I do?

You can use the cow for work, but accept that she may not conceive on time, if at all, and milk production will be reduced.

What are the productive costs of using cows for work?

If the cow is worked regularly then milk production and weight loss will occur unless she is given supplementary feed of a good quality. As an approximation,

the energy used up in one day of moderate work (3 hours weeding or 4 hours carting) is about equivalent to the amount in 4-5 l of milk or 800-1,000 g of live weight.

Can I use dairy crossbred cows for work?

Local x exotic crossbred dairy cows are often larger than local cattle and so are good for work. However dairy crosses produce more milk than local cattle (Figure 6) and so need even better feeding and a rest from work in late pregnancy and early lactation. As a guide lactating dairy cows will have a one-day delay in conception for each day of work.

Exotic breeds and their crosses are more susceptible to heat stress when working than local indigenous cattle. The best animals to work are those that are well adapted to the local conditions. If calf production is important then the indigenous animals are likely to be best. If you want to sell some milk then a local x exotic crossbred is more suitable, having a higher milk production than the indigenous breeds. The indigenous breeds will be more disease resistant/ tolerant and less likely to be heat stressed during work than the exotic breeds.

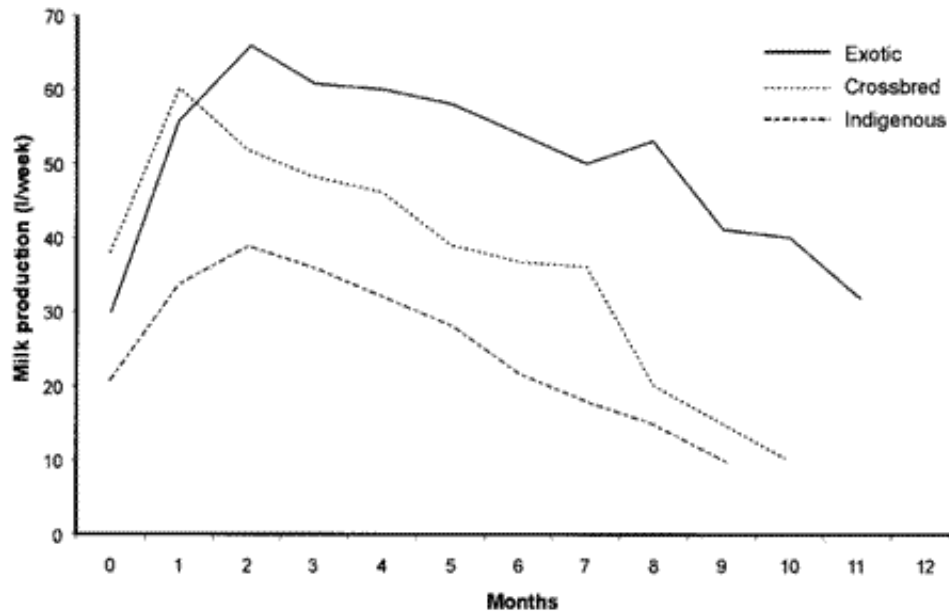


Fig. 6 Typical lactation curves of an exotic breed

What are the main characteristics to look for when choosing a cow for draught purposes?

Good physical characteristics and body conformation are some of the key issues to look for when selecting cows for work. These include: straight back, straight legs, well built chest and neck and good eyesight. The cow should also be in good health and have a calm temperament.

Are there any special implements which are suitable for use with working cows?

Working cows can use any equipment use by oxen, e.g. a standard ox plough. Lighter implements which are increasing being used by donkeys can be a good compromise as they require less draught force and can be operated by women

farmers.

What type of field operations can a working cow perform?

Working cows can do all operations which are normally done by oxen or donkeys. These include: ploughing, row planting, ridging, weeding and transport services using ox-carts.

Should I work my cows in the same way as working oxen?

Yes, but they may need to rest more often if they are smaller and not as strong as the oxen you may have used before.

How should a cow be harnessed for optimum power output?

Cows can use a double neck yoke (pair) or single yokes to generate pulling power. Normal yokes used by oxen can be used. In other places collar harness has been tried and produced good results.

When is the best time to use my cows for work in relation to pregnancy and lactation?

When the feed requirements for pregnancy and lactation are at their lowest. A cow needs the best feed in the month before the birth of the calf and in the month following it. The lowest feed requirements are in mid to late lactation, when milk yield is low (the calf from the previous year should be weaned) and before the foetus begins to grow rapidly. This is the best time to work. Rapid foetal growth begins about 240 days after the cow has conceived (Figure 7).

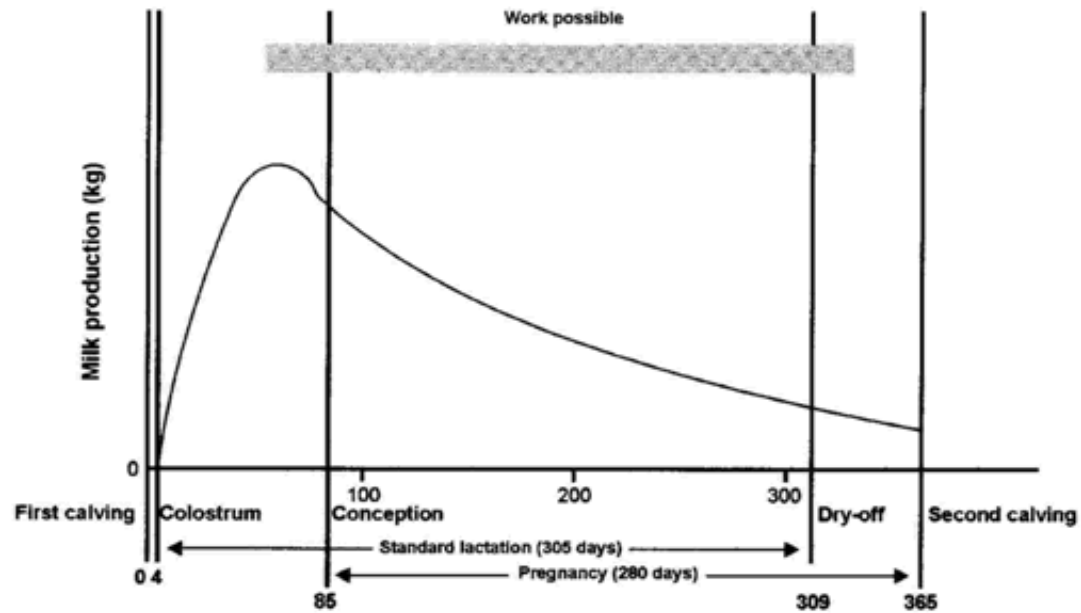
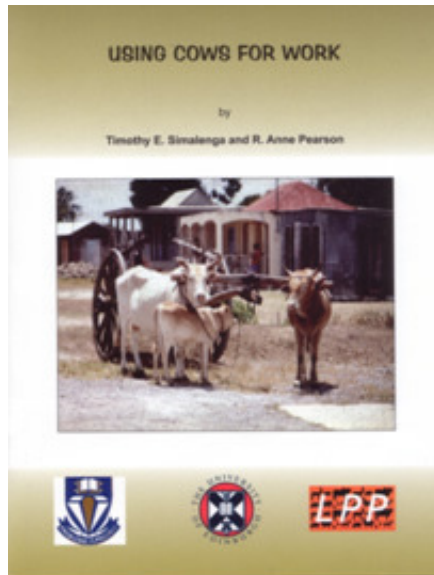


Fig. 7 An ideal cow year with the best times to work the cow indicated



Fig. 8 Water buffalo cows can also be used for work



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Planning

Planning is essential when using working cows. It is a good idea to make a calendar plan for the 12 months of the year.

If you want to see when is the best time for the working cows to calve and when to supplement them so they are in good condition to conceive:

For each month put on it:

- **The number of days work needed in that month (count 5 hours as a full day, 2-3 hours as a half day)**
- **The amount of basal feed that is available - grazing and crop residues on a scale from 1 (very little) to 6 (plenty) for all animals**

The period where feed is in good supply, but work required of the animals is low, is the best time for calving, but bear in mind the cows cannot work in the last month of pregnancy or first month of lactation. You may have to plan for them to calve out of the main work season at a time when basal feed supplies are low. At this time feed supplementation is essential.

If you have your cows calving in a particular month and need to decide when to supplement them and when to work them:

For each month put on it:

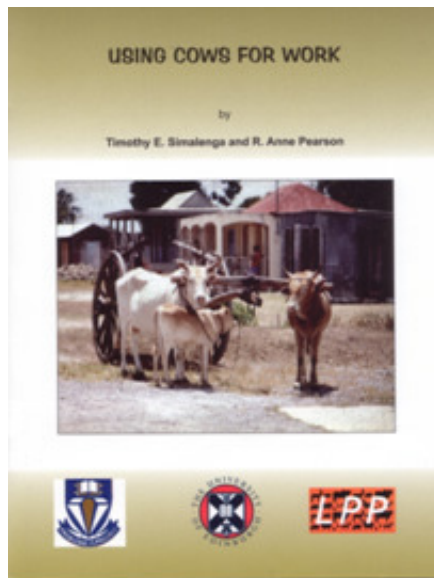
- **The month of calving and the month before and after calving**
- **The amount of basal feed that is available, i.e. grazing and crop residues on a scale from 1 (very little) to 6 (plenty) for all animals**

You will not be able to work the cows in the last month of pregnancy or first month of lactation and will need to supplement them well if:

- **The main work season coincides with the last third of pregnancy or the first**

third of lactation

- **The time when basal feed is in short supply coincides with late pregnancy or early lactation.**



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