White cottonseed - a supplementary cattle feed

August 2016, Primefact 303, Second edition
Todd Andrews, Beef Development Officer, Armidale

Introduction
White cottonseed (WCS) is the seed remaining after the ginning process. It is known as white cottonseed as it still has some cotton lint left on it. It is an ideal supplement for stock to maximise use of dry standing feed and during drought, although producers still need to be aware of some restrictions around its use.

Residues
White cottonseed may contain residues of chemicals applied to the cotton crop during growing or harvest and so producers should request a Commodity Vendor Declaration (CVD) each time they purchase it. That Declaration supports stock raising claims and provides a record that the relevant holding periods and export slaughter intervals have been observed. If no CVD is obtained, cattle sold or processed within 60 days of being fed WCS must be identified in Question 7 of the National Vendor Declaration.

Gossypol toxicity
Whole cottonseed can contain up to 1% gossypol- a toxic dye in the kernel pigment glands. While mature ruminants (eg cattle, sheep) can break down some gossypol in the rumen, it must NOT be fed to pigs, poultry or horses. It should not be fed to weaned calves less than 3-4 months old, although there are no reports of calf losses when feeding cows with young calves during joining.

Feed value
White cottonseed is high in energy and protein (Table 1) but also provides fibre, mostly from the seed hulls. Most of the energy is in the form of oil (Table 1) which can inhibit rumen function when it exceeds 6% of total diet. Digestion of WCS in the rumen releases nutrients slowly, which means that it can be fed twice weekly.

Table 1. White cottonseed feed value.

<table>
<thead>
<tr>
<th>component</th>
<th>typical value</th>
</tr>
</thead>
<tbody>
<tr>
<td>dry matter</td>
<td>90 - 93%</td>
</tr>
<tr>
<td>energy</td>
<td>13 -14MJ ME/kg DM</td>
</tr>
<tr>
<td>digestibility</td>
<td>80%</td>
</tr>
<tr>
<td>crude protein</td>
<td>20 - 24%</td>
</tr>
<tr>
<td>acid detergent fibre (ADF)</td>
<td>35 - 45%</td>
</tr>
<tr>
<td>oil content</td>
<td>15-22%</td>
</tr>
</tbody>
</table>

Note that most cotton grown in Australia is genetically modified (GM) and not segregated. Therefore WCS cannot be fed to stock being marketed in programs that prohibit GM feeds.

Feeding cottonseed
Cottonseed can be fed alone or combined with other feeds. It does not require rolling, milling or other processing and cannot cause acidosis. Molasses, salt or grain can be used to entice stock not familiar with WCS, though once started palatability is not a problem. Consider feeding daily amounts, to monitor acceptance and intake, for up to 10 days before switching to feeding every second day or twice weekly.

Allow 600mm per head when feeding adults in troughs. Use small dumps (enough to feed four head per dump) if feeding on the ground.

Where there is adequate standing feed available (>1200kg DM/ha), WCS can be available all the time for example in tractor tyre feeders. Note that intake generally increases as pasture quality and availability declines.
Another option is to dump a load of cottonseed in a paddock, encircle with an electric fence and then either push WCS under the fence or move the fence to feed stock.

**Amounts required**

Cottonseed is a suitable supplement for stock grazing low quality feed, such as cereal stubble or mature / frosted / drought affected tropical grass pasture with no visible green content. Under these conditions, it can be fed at up to 0.5% of bodyweight for cows, and 0.33% for weaned calves, per day (Table 2).

It can also be combined with other feeds as a full ration during drought. For example, mix 70% grain: 30% WCS, plus a roughage source.

<table>
<thead>
<tr>
<th>stock class</th>
<th>kg/head/day</th>
</tr>
</thead>
<tbody>
<tr>
<td>lactating cows</td>
<td>2 - 3</td>
</tr>
<tr>
<td>dry – pregnant cows</td>
<td>1 - 2</td>
</tr>
<tr>
<td>yearlings 250-350kg</td>
<td>1 - 2</td>
</tr>
<tr>
<td>Weaned calves 100-150kg</td>
<td>0.5</td>
</tr>
</tbody>
</table>

**Feeding cottonseed to bulls**

Overseas pen feeding trials have shown that gossypol in WCS can reduce semen production over time. In practice, many bulls have been fed WCS along with cows and calves during the joining period, often in unregulated or large amounts, with no reports of infertility. As a precaution, do not feed large amounts of WCS to bulls in the months prior to joining.

**Handling and storing WCS**

Twelve tonnes of WCS is equivalent in volume to 20T of grain and it is mostly distributed either in tip trucks or specialised ‘moving floor’ trailers. It should be stored in sheds as it needs to be moved with a loader or by shovelling. It should not be stored in a silo and cannot be augered.

It can be stored for short periods in the open, uncovered, in a well-drained area. The dump should have a peak and smooth sides to shed water.

Note that WCS can combust spontaneously and so should not be stored with a moisture content above 14% or in stacks above 5m high. Mouldy WCS can cause deaths or poor performance due to aflatoxins. Storage life can be several years, though WCS can be infested by weevils.

**Acknowledgments**

This Primefact is based on a publication written by Ian Blackwood (NSWDPI) and was reviewed by Ian Blackwood and Roger Sneath (QDAF).

www.dpi.nsw.gov.au

© State of New South Wales through the Department of Industry, Skills and Regional Development, 2017. You may copy, distribute and otherwise freely deal with this publication for any purpose, provided that you acknowledge NSW Department of Primary Industries as the owner.

Disclaimer: The information contained in this publication is based on knowledge and understanding at the time of writing (January 2017). However, because of advances in knowledge, users are reminded of the need to ensure that information upon which they rely is up to date and to check currency of the information with the appropriate officer of the Department of Primary Industries or the user’s independent advisor.

ISSN 1832 6668