Producers wanting to transition to a polled herd can achieve the desired outcome in a variety of ways. The pathway chosen will affect the time taken to achieve a polled herd and will also affect the cost. This fact sheet describes how producers can transition to a polled herd, and some of the factors that need to be considered.

**Considerations when deciding to transition to a polled herd**

- For breeds that have both horned and polled genotypes, the number of polled animals may be lower than the number of horned animals.
- Depending on the breeding strategy and herd management utilised, transitioning to a polled herd can take a long time to achieve.
- The longer the generation interval the longer the time taken for introgression of genetic traits.
- Focussing solely on polled status (single trait selection) is not advisable because performance in other economically important traits may be compromised.
- Increasing demand for polled genetics may mean that bulls confirmed to be homozygous polled via gene marker tests may become more expensive.

**Increasing the proportion of polled genes in your herd**

Selection to increase the proportion of polled genes in a herd begins by including polledness as a selection criterion when choosing bulls. As with all other traits, individual sires contribute proportionally more genetic material to the herd than cows (i.e. each generation a bull may have many progeny, whereas a cow will have only one offspring). Horned sires will have a high proportion of horned progeny. Selecting phenotypically polled sires (which can be either homozygous or heterozygous polled) will reduce the number of horned progeny. 

When selecting phenotypically polled animals take care not to confuse or mistake dehorned animals for polled animals.

By only selecting sires which have been confirmed to be homozygous polled via polled gene marker testing, the rate of polled gene introgression from sires can be maximised.

**Selection in the breeding herd**

Breeders who are able to apply a level of selection pressure to their cow herd can also use these rules for females.

Putting priority on culling phenotypically horned cows will reduce the frequency of horned genes in

**FAST FACTS**

- Unlike many traits of importance to beef producers, horned status is completely controlled by genetics; environmental factors have no impact on horned status.
- Producers should consider horned status as only one trait in a breeding program.
- The Australian Polled Gene Marker test can identify some of the genes controlling the trait, with high accuracy for some breeds (see “Australian polled gene marker test” for details).
- The aim of a polled breeding program is to increase the frequency of polled genes and reduce the proportion of animals with a horned phenotype.
- Homozygous polled sires will allow the desirable polled gene to dominate the herd more quickly than using a heterozygous polled sire.
- Long generation intervals for cattle mean that “introgression” (desirable genes being introduced to the herd) can take a long time. For many herds in Northern Australia a generation can exceed 4 years.
subsequent generations. Retaining only females which are polled will increase the frequency of polled genes in the herd.

Giving priority to the retention of females which are confirmed to be homozygous polled, via polled marker testing, will maximise the rate of polled gene introgression into a self replacing herd.

**Finding the right breeding strategy**

A number of different breeding strategies can be used to introduce polledness.

Producers could choose to use heterozygote polled bulls, or they could introduce homozygote polled bulls of the same breed as their herd females. Alternatively producers may choose to crossbreed. In the tropics this would ideally mean using tropically adapted “true” polled bulls to ensure that levels of adaptation in the herd remain adequately high.

Polled bulls could be introduced to the commercial herd or to the nucleus herd for producers who breed their own bulls, and separate these sections of their enterprise. Phenotypically polled animals could be selected from within the commercial herd, with the option of polled marker testing available to breeders who want to maximise the rate of polled gene introgression. Using AI sires which are confirmed to be homozygous polled is also an option.

Regardless of the strategy or combination of strategies used, the underlying principle is that polledness will be achieved more quickly if homozygous rather than heterozygous polled bulls are used.

**Further considerations**

The genotype of the cows that are used for breeding will also influence the time taken to achieve the polledness breeding objective. Herds with a high proportion of horned females will take longer to transition than a herd with a high proportion of polled females. Even amongst phenotypically polled cows, a herd dominated by heterozygous cows will mean a slower transition than for a herd with a high proportion of homozygous polled females.

The selection policy will affect the rate of transition. A producer may aim to breed only phenotypically polled females, or may choose to accept some horned females (based most likely on relative genetic merit for other traits).

The speed of introgression will be affected by many of the factors which determine the rate of genetic progress when selecting for any trait including:

- The polled/horned genotype of the bulls introduced
- Bull replacement rate
- Proportion of polled bulls introduced to the herd
- Cow replacement rate
- Proportion of polls, scurs and horns present in the cow herd
- Age at first calving
- Calving and weaning rate
- Importance of polledness in the breeding objective
- Breed of the herd

**Homozygous polled bulls get you there faster: a worked example**

A producer has a herd of 100 phenotypically horned Brahman cows and decides to breed for polledness by purchasing polled bulls. Phenotypically polled bulls could be genotypically Homozygous PP or Heterozygous PH.

In this example we will assume a 100% calving rate, with all females retained. Progeny are 50% male and 50% female. Proportion of polled, scurs and horns in the herd is assumed to be the same as the validation population used to develop the poll gene marker test.

Two scenarios are possible: the producer could source either of 2 bull genotypes i.e. “PP” or “PH”.

<table>
<thead>
<tr>
<th>100 Phenotypically Horned cows</th>
<th>Genetically PP Bulls</th>
<th>Genetically PH Bulls</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First generation</strong> (progeny of the 100 cows)</td>
<td></td>
<td></td>
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<tr>
<td>Phenotypically</td>
<td>Phenotypically</td>
<td></td>
</tr>
<tr>
<td>25 polls</td>
<td>13 polls</td>
<td></td>
</tr>
<tr>
<td>64 scurs</td>
<td>38 scurs</td>
<td></td>
</tr>
<tr>
<td>11 horns</td>
<td>49 horns</td>
<td></td>
</tr>
<tr>
<td><strong>Second generation</strong> progeny from female portion of first generation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>29 polls</td>
<td>13 polls</td>
<td></td>
</tr>
<tr>
<td>17 scurs</td>
<td>18 scurs</td>
<td></td>
</tr>
<tr>
<td>3 horns</td>
<td>19 horns</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Number of progeny after 4 years</th>
<th>Number of progeny after 4 years</th>
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<tbody>
<tr>
<td>129 polls</td>
<td>65 polls</td>
</tr>
<tr>
<td>273 scurs</td>
<td>170 scurs</td>
</tr>
<tr>
<td>47 horns</td>
<td>215 horns</td>
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</table>

Note that the first generation from the cows only takes 9 months from mating to achieve due to the fact that breeders are already
mature. Assuming heifers calve at 3 years old, subsequent generations will take 3 years. Therefore in total the original phenotypically horned cows calve 4 times before their first progeny calve. For a herd that calves heifers for the first time at 3 years of age, 2 generations = 6 years.

Producers also need to consider the numbers achieved in the example given will be affected by

1. the number of replacements retained – fewer heifers retained will reduce the rate of genetic progress
2. calving and weaning percentage – low calving and weaning percentages will reduce the potential rate of replacement and therefore the rate of genetic progress
3. The frequency of theorised African horn or scurs genes in the herd will affect progress but currently there is little scientific understanding of the likely impact of these theorised genes. i.e. low frequencies of African horn gene and scurs gene will increase progress rate. High frequencies of African horn gene and scurs gene will slow progress.

**Conclusion**

Even though it may take a long time for introgression of the desired polled genes to be complete, it is possible to most rapidly transition to a polled herd by using homozygous “PP” type bulls rather than “PH” heterozygous type polls or horned HH type bulls.