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### **C-3. Selection for growth and feed efficiency – The Australian experience**

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Profitability in beef production is influenced by a number of traits, including growth and feed efficiency. This paper reviews key Australian selection experiments on growth and feed efficiency, and the beef industry adoption of selection for these traits. Response to selection for growth has been demonstrated by a divergent selection experiment. Five generations of divergent selection for growth resulted in 19% divergence in yearling weight and 18% in weaning weight, and no effect on carcass composition at maturity. Selection for growth in industry herds started in the 1980s, with a steady rate of genetic gain being achieved. In Australian Angus seedstock population, for example, the annual genetic gain in estimated breeding values (EBVs) for 400-day weight was 0.15 standard deviation units from 1998 to 2003. As with growth, selection for feed efficiency has been demonstrated by a divergent selection experiment for residual feed intake (RFI). Two generations of selection produced an annual divergence of 0.25 kg/day of 10MJ ME feed with no correlated responses in growth and meat quality of young cattle. Cow weight and reproduction were not affected, however, High RFI cows tended to have higher subcutaneous fat depth relative to Low RFI cows. Testing for RFI in industry herds started in 1996, and from 2002, RFI EBVs are provided for seedstock Angus and Hereford cattle. Several studies have indicated substantial economic benefit from selection for low RFI, however the initial high cost of testing to identify superior animals is an impediment to industry adoption.

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Resources of the *Bovidae* family abound in China. They include *Bos taurus*, *Bos indicus*, water buffalos and yaks. All *Bovidae* are called cattle in China for some unknown traditional reasons. In 2004, there were 116 million head of cattle in the country. Sixteen beef cattle breeds, including dual-purpose ones, were imported from other countries before and after the People's Republic of China was founded in 1949. In addition to being pure-bred, these breeds have been used to improve the local Chinese yellow cattle. The total beef production has reached 6,758,000 tons with 4.8 kg of average beef consumption per capita in 2004. Although the population of beef cattle has been fast increasing in recent years, the quality of beef has not been improved accordingly. Compared with the specialized beef breeds in other countries, China's native beef cattle breeds have a poorer growth performance reflected by their slow growth rate and low feed conversion efficiency, and a relatively less beef quality based on flavor, tenderness, marbling, nutrient content and sanitation. In recent years, the concerns of BSE and FMD in beef cattle and the potential residue of chemicals, antibiotics, aflatoxin, *E. coli* O157 and the other verocytotoxin - producing *E. coli* (VTEC) in beef have become a new emerging food safety issue to the public. In order to improve the development of beef production, researches should be undertaken on strain breeding of yellow cattle, breed standard identification, progeny testing, efficiently artificial insemination using frozen semen, optimal beef cattle feeding system, tracing back system of beef quality and beef marketing strategy.