Proposed BIF Guidelines for Performance Data and EPD on Clones

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Somatic Cell Clones

- Cloning of cattle is occurring on a relatively small scale
- Potential for impact on genetic improvement of beef cattle
  - Provide "backup copies" of a valuable AI sire in case of injury or death
  - Allow transmission of proven sire's genetics via natural service
  - Increase number of progeny produced by an elite female

Genetic Evaluation

- The economic value of a clone is determined not only by its true genetic merit, but also by the genetic evaluation with which its progeny will be marketed
- At least two US beef breed associations have interim policies for genetic evaluation of clones
- Those policies vary, and other associations have asked BIF to provide a guideline

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Key Assumption

- Clones have identical chromosomes to their donors, and thus will transmit equivalent genetic effects
- This assumption can be tested when more progeny of clones are born and measured
- USDA dairy cattle evaluations made this assumption, prior to using genomic prediction

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Performance Data on Clones

- Measurements taken on clone animals are likely not useful for genetic evaluation
  - Unique environment/contemporary group
  - Health issues?
  - Most beef clone donors are relatively proven animals

Modeling Progeny of Clones

- For progeny of clone bulls, evaluation procedures are straightforward
- A calf sired by a clone would be considered to have been sired by the donor
- Calf sired by clone bull will have same EPD and accuracy as if it were sired by donor
- Database should track which clone was the actual sire, for use in future research

Modeling Progeny of Clones

- Calf produced by clone cow receives:
  - Same genes as donor's calf
  - Different maternal effect (phenotype of clone)
  - Different permanent environmental effect (effect of clone)
- Such a calf would be modeled like an ET calf produced from the donor's egg
- Most associations would not use weights of clone cow's calves in evaluations

Summary

- Clone EPD/Acc = Donor EPD/Acc
- Progeny of clone bull = progeny of donor bull
- Progeny of clone cow = ET progeny of donor cow
- Future generations of clones would be evaluated normally, with the donors, rather than the clones, as their ancestors

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Questions/Comments?