

Interbull Survey on Parentage Verification

J.W. Dürr, F. Forabosco, J. Jakobsen and B. Zumbach

Interbull Centre, Department of Animal Breeding and Genetics, SLU, Box 7023

S-75007 Uppsala, Sweden, joao.durr@slu.se

Abstract

The use of informative SNPs for parentage verification instead of microsatellites data has been proposed in the literature given the current availability of such kind of information from the genomic evaluations carried out by most countries. Given this opportunity, Interbull carried out a survey to verify the interest on establishing an international SNP data repository and to determine which business model the eventual new service should have. Most respondents favor the creation of the repository for the purpose of facilitating exchanges among Interbull customers only.

Key words: SNP, international repository

Introduction

Parentage verification in cattle is necessary to improve the accuracy of pedigree information and consequently of genetic evaluations. Different techniques have been applied to that purpose, such as the analysis of blood groups and microsatellite markers, but the recent abundant availability of SNP data has incentivized researchers to use a small number of these markers to verify paternity (Fisher *et al.*, 2008; Hayes, 2010). A joint effort between the International Society of Animal Genetics (ISAG) and the International Committee for Animal Recording (ICAR) is under way to propose the use of SNP data for official parentage testing (Harding, personal communication).

Following suggestion presented during the Interbull technical workshop in Guelph (February 2011), the Interbull Centre carried out a survey among all Interbull customers to assess the potential demand for an international repository of single nucleotide polymorphisms (SNP) information with the specific aim of facilitating parentage verification of the animals included in the Interbull international pedigree. The aim of

this article is to summarize the results of the survey.

Materials and Methods

The survey was elaborated as an online multiple choice form with eight questions and sent only to Interbull customers, who had the whole month of June 2011 to reply. A total of 21 responses were received, from representatives of the following countries: Australia, Austria, Czech Republic, Denmark, France, Germany, Hungary, Ireland, Israel, Italy (2), Japan, Norway, Poland, Portugal, Slovenia, Spain, Sweden, Switzerland and United States (2).

The responses are simply expressed in terms of percentages, presented during the Interbull business meeting in Stavanger, Norway, and interpretation is enhanced by the discussion carried out at that occasion.

Results & Discussion

Figures 1 to 5, as well as Tables 1 and 2 show the questions asked and the respective

responses. The survey focused on a well-defined subject as a means to verify: a. the willingness of Interbull customers to share SNP data for parentage verification; b. the interest on a parentage verification service run by Interbull; and c. the probable business model to be adopted by Interbull.

It is quite evident from Figures 1, 3 and 4 and Table 1 that the overall perception about having a common repository of SNP information for parentage verification is favorable. Most respondents indicated that they see a value on this action.

However, the reaction was the opposite towards having parentage verification run as a service by Interbull (Figures 2 and 5, Table 1). This reaction seems to have a double motivation: part of the respondents simply believe this is not the role of Interbull and another group is against a service that may interfere with the services provided by the national organizations.

Given the above, the indication for business model is that Interbull should host the parentage SNPs mainly to facilitate exchanges among participating countries. In principle, access to the SNP repository would be granted only to Interbull customers. A clear indication of the target group of animals to be included in the repository needs to be given (Table 2) and objective rules for participation also have to be established.



Figure 1. Question 1.

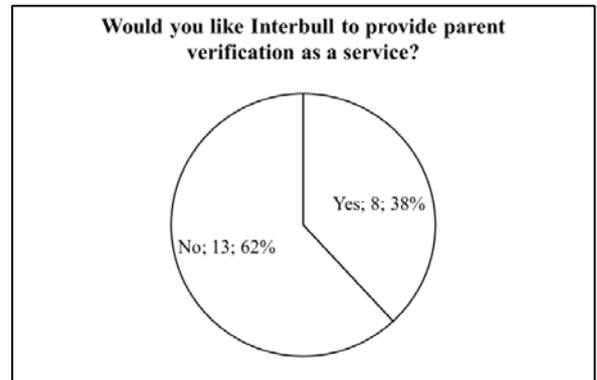


Figure 2. Question 2.

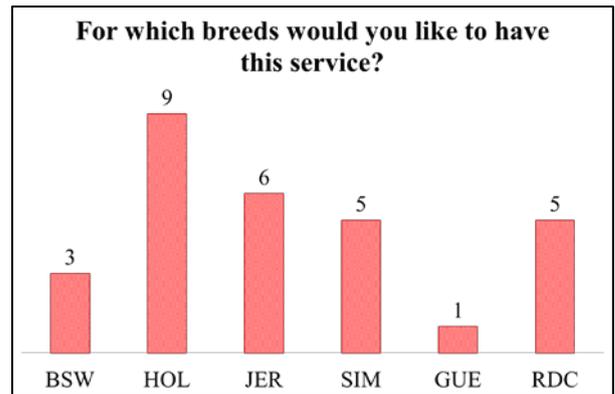


Figure 3. Question 3.

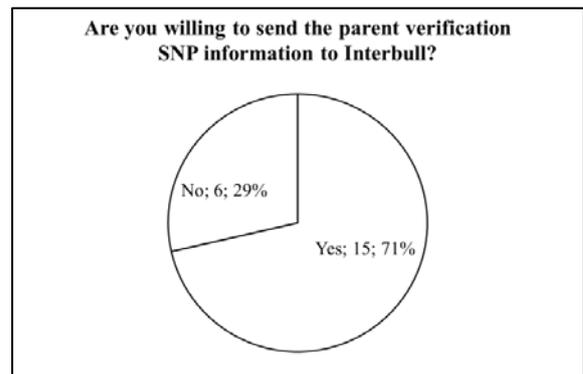


Figure 4. Question 4.

Table 1. For how many animals would you consider sending information to Interbull (Question 5) and if Interbull offers a parentage verification service, for how many animals would you consider using the service (Question 6)?

Send SNP info to Interbull	Use Interbull parentage verification service
3000	0
1500	0
5000/year	2000/year
All	NA
500	50
1000	50
	130
0	0
1800	2000
5000	0
10000	0
40000 – males only	0

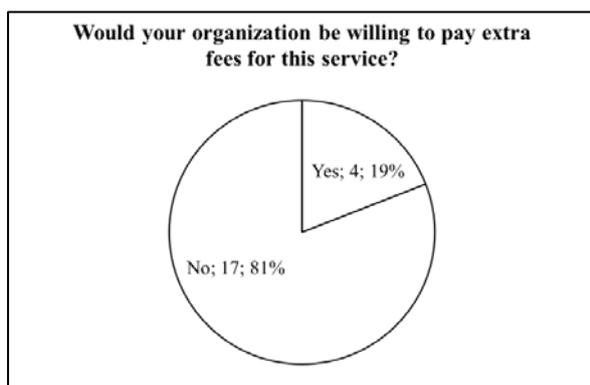


Figure 5. Question 7.

Table 2. Summary of the additional comments from respondents (Question 8).

-
- Firstly, the SNP parentage verification method needs to be official
-
- Priority will be given for national solutions before investing in Interbull
-
- Probably having a SNP repository kept by Interbull will be useful for animals with parents abroad
-
- Interbull should be limited to the development of a platform for SNP exchanges
-
- SNP information would be useful for parentage verification of progenies, not for the AI bulls themselves
-
- The population of animals to be sent must be clearly defined
-
- An international common repository of parentage SNPs available for member countries would be helpful
-
- Interest on having a parentage verification service depends on price
-
- SNP method potentially useful for beef cattle and dairy animals other than AI bulls, which is not within Interbull's role
-
- SNPs for parentage verification should be available for all evaluation centres/countries that submit their own SNPs for that purpose
-
- Interbull should be the clearing house only, not provide parentage verification
-

Conclusion

Interbull should create a SNP data repository for parentage verification to facilitate exchanges among Interbull customers.

References

- Fisher, P.J., Malthus, B., Walker, M.C., Corbett, G. & Spelman, R.J. 2008. The number of single nucleotide polymorphisms and on-farm data required for whole-herd parentage testing in dairy cattle herds. *J. Dairy Sci.* 92, 369-374.
- Hayes, B.J. 2010. Technical note: Efficient parentage assignment and pedigree reconstruction with dense single nucleotide polymorphism data. *J. Dairy Sci.* 94, 2114-2117.