Milkability Genetic Evaluation in Brown Swiss : An International approach

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Abstract

EBVs for milkability are routinely computed for Brown Swiss breed in different countries interested in international semen exchange. Milkability index is getting more and more important in determining price and quantity of semen exchanged among those countries. The European federation of Brown Swiss Breeders decided recently to investigate on future possibility of international EBV estimation on milkability. Official EBVs computed in different countries were collected and analysed with the aim of providing a first feasibility assessment for an international EBV estimation procedure. The number of common sires and the pseudo-genetic correlations estimated ranging from 70 % to 94% are encouraging for future studies.

Keywords: Brown Swiss, Milkability, International evaluation.

Introduction

Milking speed can be considered one important functional trait in dairy cattle (Groen,1997; Santus, 1998). A genetic selection against slow milking cows, if put into practice, would be well accepted by farmers with the idea of improving udder health and increase profits. It is well known that milkability is one of the functional traits that affect involuntary culling(Frerking,1999).

Usually milkability is measured as milking speed, either recorded instrumentally or with subjective judgement. Different approaches are described in literature (Banos and Burnside,1992; Beard, 1993; Canavesi and Santus, 1996). The usage of milking flowmeters is increasing and is spreading at international level. The interest at international level for EBVs for milkability for sires in the Brown Swiss breed is increasing and there is a need of standardization and comparison of figures estimated in different countries.

Recently the board of the European Federation of Brown Swiss breeders has adopted a resolution giving full support to a preliminary study of the trait at international level and appointed one representative to propose an international approach for this trait at Interbull level as well. Objective of this study is to inform the international community of the state of the art with respect to milkability national and international evaluations and to ask directions for future steps.

Materials and Methods

Milkability EBVs are routinely estimated in some countries for Brown Swiss breed, namely: Austria, Canada, France, Germany, Italy and Switzerland Each country has his own (Interbull, 2004). scheme of data collection and there are different data definition at farm level when data are collected. Mainly there are three type of milkability measurement: one is based on subjective scores given by farmers using a one to five scale. Those data are generally collected afterwards by official personnel. The second type of data collection scheme is based on stopwatches used by official personnel. Trait definition is the ratio between milk emissed and milking time .The third type of data collection relies on LactoCorder flowmeters. Milking speed in this case is defined as milk produced in one minute in the main part of the milking going from A to C in figure 1. Data collected on a categorical scale are then Snell converted before further computations.



Figure 1. LactoCorder data scheme.

With the aid of a small survey the situation at international level has been monitored and EBVs of sires computed in different countries have been used in the present study

Data are recorded as in Table 1.

Table 1. data collection.

Country	Cow tested	Method of measurement	Records/ year	
Canada	All parity	Subjective score	600	
Germany (Bayern)	All parity	LactoCorder	34500	
Germany (Baden)	All parity	Stopwatches	4100	
Austria	All parity	Stopwatches	9400	
France	All parity	Subjective score	2300	
Switzerland	First calvers	Subjective score	40000	
Italy	All parity	LactoCorder	10100	

Data are used in order to get EBVs as in Table 2:

Table 2. Methods of analysis. ST (single trait),MT (Multiple traits) AM (animal Model).

Country	Method used
Canada	ST-AM
Germany	MT-AM
Austria	MT-AM
France	MT-AM
Switzerland	ST-AM
Italy	ST-AM

Models of analysis used are quite different in different countries.

Milkability is part of overall selection indexes in some countries with the weights given in Table 3.

Lubic C . Relative importance of initiating:			
Country	Relative weight (%)		
Canada	0,5		
Germany	3,8		
Austria	3,8		
France	0		
Switzerland	6,0		
Italy	12		

Table 3. Relative importance of milkability.

The need of converting EBVs for milkability from foreign countries produced the use of conversion formulae approach in order to provide quick answers to practical needs. Nowadays, for example, EBVs for milkability from foreign countries are routinely converted by a conversion formula before their inclusion in the global selection index in Italy.

Results

Sire's EBV computed in different countries were received from genetic evaluation units of Germany/Austria, Italy, Switzerland, France and Canada. Common sires and raw correlation among EBVs, (indicated as pseudo genetic correlations from now on) were computed in order to give an idea of feasibility of an international evaluation for milkability. Tables 4 and 5 give the results of those computations

Table 4.

Diagonal: number of sires in national evaluation (rel >=50)

Upper half matrix: number of common sires (rel >=50)

Lower half matrix: number of common sires (rel. >= 70)

	ITA	DEA	CHE	FRA	CAN
ITA	495	101	91	41	29
DEA	62	3944	157	52	42
CHE	50	130	1664	42	29
FRA	32	50	39	125	22
CAN	16	24	15	14	105

Table 5.

Upper half matrix: correlations among common sires (rel >=50)

Lowe	r half	matrix:	correlations	among	common
sires (rel. >=	= 70)			

(/			
	ITA	DEA	CHE	FRA	CAN
ITA		70,4	78,5	82,6	85,9
DEA	82,4		84,2	79,1	74,9
CHE	85,5	87,9		85,9	86,5
FRA	83,9	79,4	87,9		90,7
CAN	85,2	80,6	93,6	92,9	

Conclusions

From the first analysis of international data on milkability emerged an indication of a possible feasibility of an international evaluation for this trait. The number of common bulls among main countries seems high enough to support an international evaluation. The pseudo genetic correlations between countries are, generally speaking, of some interest and suggest further work with the idea of introducing more sophisticated analysis.

The need of an international service is recognised in the international Brown Swiss community and the importance of the trait is a well accepted fact.

This general scenario suggests possible strategy for the future of a possible genetic evaluation for milkability, starting with Brown Swiss breed but aiming at possible future expansion to other breeds.

As usual when considering a new service a discussion should raise in order to decide if

conversion formulae is a good enough approach or a more robust method should be used. In that case both MACE or borderless evaluation could be used as options.

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