ABSTRACT

Data on milk traits of Austrian Fleckvieh cows were collected by the Official Federation of Austrian Cattle Breeders (ZAR) in lower Austria. Records used were those of primiparous and multiparous cows calved in two consecutive years from January 1990 to September 1991. All records of milk traits were 305- day or shorter completed lactation. Data analysis was carried out in the Department of Animal Production, Faculty of Agriculture, Zagazig University.

The objectives of the present study were: (1) to estimate the influence of non- genetic factors on recorded- and simulated 305- day milk traits under bimonthly; trimonthly; quadramonthly and fivemonthly recording systems , as well as their reliability measurements in Fleckvieh cattle., (2) to estimated the genetic parameters (heritability estimates of previous traits and the genetic-; phenotypic- and environmental correlations., (3) to evaluate the reliability measurements (biases of simulated- from recorded 305- day milk traits (BMT) ; percentages of simulated- from recorded 305- day milk traits (PSRMT) and percentage bias of simulated- from recorded 305- day milk traits (PBMT) under different recording systems and (4) to estimated direct - and correlated response per generation due to single trait selection for simulated 305- day milk traits under different recording systems and determine which recording system was the best to applied it in the genetic improvement programs of milk traits.

Different four systems were used, each one with many sub systems, except the bimonthly recording system. Those systems were recording at bimonthly – , trimonthly –, quadramonthly –

and fivemonthly. Comparing their estimated genetic parameters and genetic improvement. It seemed that under the fivemonthly recording systems (FRS_5) the best estimates of genetic parameters and direct and indirect genetic improvement of milk traits were obtained. Therefore, it was concluded that by using this system, could be utilized satisfactory in simulating 305 – day milk yield traits and to saving the time and the efforts of recordings, if there was no possibility to apply the standard one.

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LIST OF ABBREVIATIONS

AC	Age at calving
AFC	Age at first calving
AI	Artifical insemination
BFPY	Biases of simulated- from recorded 305- day fat-plus- protein yield (kg)
BFY	Biases of simulated- from recorded 305- day fat yield (kg)
BMT	Biases of simulated – from recorded 305- day milk traits (kg)
BMY	Biases of simulated- from recorded 305- day milk yield (kg)
BMYT	Biases of simulated- from recorded 305- day milk yield traits (kg)
BPOF%	Biases of simulated- from recorded 305- day protein yield / fat yield as (%)
BPY	Biases of simulated- from recorded 305- day protein yield (kg)
BR	Bimonthly records
BRS	Bimonthly recording systems
BRS_1	Bimonthly recording system, where the first monthly test- day started at the first month of lactation.
BRS_2	Bimonthly recording system, where the first monthly test- day started at the second month of lactation.

BV	Breeding value
CI	Calving interval
CM	Calving month
CR_Y	Correlated response due to selection
CS	Calving season
CY	Calving year
CYS	Calving year – season
D	Day
DO	Days open
FCM	Fat corrected milk
FPY	Recorded 305- day fat- plus- protein yield
$FPYBRS_2$	Simulated 305- day fat- plus protein yield under BRS_2
$FPYFRS_i$	Simulated 305- day fat- plus protein yield under FRS, where i = 2 ; 3 ; 4 and 5
$FPYQRS_i$	Simulated 305- day fat- plus protein yield under QRS, where i =2 ; 3 and 4
$FPYTRS_i$	Simulated 305- day fat- plus protein yield under TRS, where i =2 and 3
FRS	Fivemonthly recording systems (FRS_2 ; FRS_3 ; FRS_4 and FRS_5)
FRS_2	Fivemonthly recording system, where the first monthly test – day started at the second month of lactation.

FRS_3	Fivemonthly recording system, where the first monthly test- day started at the third month of lactation.
FRS_4	Fivemonthly recording system, where the first monthly test- day started the fourth month of lactation.
FRS_5	Fivemonthly recording system, where the first monthly test- day started at the fifth month of lactation.
FY	Recorded 305- day fat yield
$FYBRS_2$	Simulated 305- day fat yield under BRS_2
$FYFRS_i$	Simulated 305- day fat yield under FRS, where i = 2 ; 3 ; 4 and 5
$FYQRS_i$	Simulated 305- day fat yield under QRS, where i = 2 ; 3 and 4
$FYTRS_i$	Simulated 305- day fat yield under TRS, where i = 2 and 3
h^2	Heritability
HR	Herd
Kg	Kilogram
M	Month
ML	Month of lactation
MR	Monthly records
MRS	Monthly recording system, where the monthly test- day taken every month of lactation

MT Recorded 305- day milk traits

$MTBRS_2$ Simulated 305- day milk traits under BRS_2

$MTFRS_i$ Simulated 305- day milk traits under FRS, where i = 2 ; 3 ; 4 and 5

$MTQRS_i$ Simulated 305- day milk traits under QRS, where i = 2 ; 3 and 4

$MTTRS_i$ Simulated 305- day milk traits under trimonthly recording system (TRS), where i = 2 and 3

MY Recorded 305- day milk yield

$MYBRS_2$ Simulated 305- day milk yield under BRS_2

$MYFRS_i$ Simulated 305- day milk yield under FRS, where i = 2 ; 3 ; 4 and 5

MYMRS Simulated 305- day milk yield under MRS

$MYQRS_i$ Simulated 305- day milk yield under QRS, where i = 2 ; 3 and 4

MYT Recorded 305- day milk yield traits

$MYTBRS_2$ Simulated 305- day milk yield traits under BRS_2

$MYTFRS_i$ Simulated 305- day milk yield traits under FRS, where i = 2 ; 3 ; 4 and 5

$MYTQRS_i$ Simulated 305- day milk yield traits under QRS, where i = 2 ; 3 and 4

$MYTRS_i$ Simulated 305- day milk yield under TRS, where i = 2 and 3

$MYTTRS_i$ Simulated 305- day milk yield traits under TRS, where i = 2 and 3

PBFPY Percentages bias of simulated- 305- day fat- plus - protein yield from recorded one.

PBFY Percentages bias of simulated- 305- day fat yield from recorded one.

PBMT Percentages bias of simulated- 305- day milk traits from recorded one.

PBMY Percentages bias of simulated- 305- day milk yield from recorded one.

PBMYT Percentages bias of simulated- 305- day milk yield traits from recorded one.

PBPOF% Percentages bias of simulated- 305- day protein yield / fat yield from recorded one as percent.

PBPY Percentages bias of simulated- 305- day protein yield from recorded one.

PHS Paternal half sibs

POF% Recorded 305- day protein yield / fat yield as a percent.

$POF\%BRS_2$ Simulated 305- day protein yield/ fat yield as a percent under BRS_2

$POF\%FRS_i$ Simulated 305- day protein yield/ fat yield as a percent under FRS , where i = 2 ; 3 ; 4 and 5

$POF\%QRS_i$ Simulated 305- day protein yield/ fat yield as a percent under QRS , where i = 2 ; 3 and 4

$POF\%TRS_i$ Simulated 305- day protein yield/ fat yield as a percent under TRS , where i = 2 and 3

PR Parity

PSRFPY Percentages of simulated- 305- day fat- plus- protein yield from recorded one.

PSRFY Percentages of simulated- 305- day fat yield from recorded one.

PSRMT Percentages of simulated- 305- day milk traits from recorded one.

PSRMY Percentages of simulated- 305- day milk yield from recorded one.

PSRMYT Percentages of simulated- 305- day milk yield traits from recorded one.

PSRPOF% Percentages of simulated- 305- day protein yield / fat yield from recorded one as percent.

PSRPY Percentages of simulated- 305- day protein yield from recorded one.

PY Recorded 305- day protein yield.

$PYBRS_2$ Simulated 305- day protein yield under BRS_2.

$PYFRS_i$ Simulated 305- day protein yield under FRS, where i = 2 ; 3 ; 4 and 5

$PYQRS_i$ Simulated 305- day protein yield under QRS, where i = 2 ; 3 and 4

$PYTRS_i$ Simulated 305- day protein yield under TRS, where i = 2 and 3.

QRS_2	Quadramonthly recording system, where the first monthly test- day started at the second month of lactation
QRS_3	Quadramonthly recording system, where the first monthly test- day started at the third month of lactation.
QRS_4	Quadramonthly recording system, where the first monthly test- day started at the fourth month of lactation.
QRS_i	Quadramonthly recording systems, where i = 2 ; 3 and 4
r^2	Accuracy
r_E	Environmental correlation
r_G	Genetic correlation
RM	Reliability measurements (BMT , PSRMT and PBMT)
r_p	Phenotypic correlation
R_x	Direct response to selection
SD	Standard deviation
SFPY	Simulated 305- day fat- plus- protein yield
SFY	Simulated 305- day fat yield
SL	Stage of lactation
SMT	Simulated 305- day milk traits
SMY	Simulated 305- day milk yield

SMYT	Simulated 305- day milk yield traits
SPOF%	Simulated 305- day protein yield / fat yield as percent
SPY	Simulated 305- day protein yield
STMY	Simulated total milk yield
TD	Monthly test – day
TFTNC	Period from the first monthly test- day to next calving date
TFY	Recorded total fat yield
TFYBRS	Simulated total fat yield under BRS
TFYTRS	Simulated total fat yield under TRS
TMY	Recorded total milk yield
TMYBRS	Simulated total milk yield under BRS
TMYMRS	Simulated total milk yield under MRS
TMYQRS	Simulated total milk yield under QRS
TMYTRS	Simulated total milk yield under TRS
TPY	Recorded total protein yield
TRS_1	Trimonthly recording system, where the first monthly test- day started at the first month of lactation
TRS_2	Trimonthly recording system, where the first monthly test- day started at the second month of lactation

TRS_3	Trimonthly recording system, where the first monthly test- day started at the third month of lactation
TRS_i	Trimonthly recording systems, where i = 2 and 3
V%	Percentage of variance
σ^2_e	Variance due to remainder
σ^2_s	Sire variance component