

## 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<sub>5</sub>) 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.

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, monthly, quarterly and fivemonthly recording systems, as well as their reliability measurements in Flockvich cattle, (2) to estimate the genetic parameters (reliability estimates of previous traits and the genetic, phenotypic and environmental correlations), (3) to evaluate the reliability measurements (bias of simulated from recorded 305-day milk traits (BMT); percentage 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 estimate 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 be applied in the genetic improvement programs of milk traits.

Different recording systems were used, each one with many systems, except the bimonthly recording system. Those systems were recording at bimonthly - monthly - quarterly -

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## LIST OF ABBREVIATIONS

<b>AC</b>	Age at calving
<b>AFC</b>	Age at first calving
<b>AI</b>	Artificial insemination
<b>BFPY</b>	Biases of simulated- from recorded 305- day fat- plus- protein yield (kg)
<b>BFY</b>	Biases of simulated- from recorded 305- day fat yield (kg)
<b>BMT</b>	Biases of simulated – from recorded 305- day milk traits (kg)
<b>BMY</b>	Biases of simulated- from recorded 305- day milk yield (kg)
<b>BMYT</b>	Biases of simulated- from recorded 305- day milk yield traits (kg)
<b>BPOF%</b>	Biases of simulated- from recorded 305- day protein yield / fat yield as (%)
<b>BPY</b>	Biases of simulated- from recorded 305- day protein yield (kg)
<b>BR</b>	Bimonthly records
<b>BRS</b>	Bimonthly recording systems
<b>BRS<sub>1</sub></b>	Bimonthly recording system, where the first monthly test- day started at the first month of lactation.
<b>BRS<sub>2</sub></b>	Bimonthly recording system, where the first monthly test- day started at the second month of lactation.

<b>BV</b>	Breeding value
<b>CI</b>	Calving interval
<b>CM</b>	Calving month
<b>CR<sub>y</sub></b>	Correlated response due to selection
<b>CS</b>	Calving season
<b>CY</b>	Calving year
<b>CYS</b>	Calving year – season
<b>D</b>	Day
<b>DO</b>	Days open
<b>FCM</b>	Fat corrected milk
<b>FPY</b>	Recorded 305- day fat- plus- protein yield
<b>FPYBRS<sub>2</sub></b>	Simulated 305- day fat- plus protein yield under BRS <sub>2</sub>
<b>FPYFRS<sub>i</sub></b>	Simulated 305- day fat- plus protein yield under FRS, where i = 2 ; 3 ; 4 and 5
<b>FPYQRS<sub>i</sub></b>	Simulated 305- day fat- plus protein yield under QRS, where i =2 ; 3 and 4
<b>FPYTRS<sub>i</sub></b>	Simulated 305- day fat- plus protein yield under TRS, where i =2 and 3
<b>FRS</b>	Fivemonthly recording systems (FRS <sub>2</sub> ; FRS <sub>3</sub> ; FRS <sub>4</sub> and FRS <sub>5</sub> )
<b>FRS<sub>2</sub></b>	Fivemonthly recording system, where the first monthly test – day started at the second month of lactation.



<b>FRS<sub>3</sub></b>	Fivemonthly recording system, where the first monthly test- day started at the third month of lactation.
<b>FRS<sub>4</sub></b>	Fivemonthly recording system, where the first monthly test- day started the fourth month of lactation.
<b>FRS<sub>5</sub></b>	Fivemonthly recording system, where the first monthly test- day started at the fifth month of lactation.
<b>FY</b>	Recorded 305- day fat yield
<b>FYBRS<sub>2</sub></b>	Simulated 305- day fat yield under BRS <sub>2</sub>
<b>FYFRS<sub>i</sub></b>	Simulated 305- day fat yield under FRS, where i = 2 ; 3 ; 4 and 5
<b>FYQRS<sub>i</sub></b>	Simulated 305- day fat yield under QRS, where i = 2 ; 3 and 4
<b>FYTRS<sub>i</sub></b>	Simulated 305- day fat yield under TRS, where i = 2 and 3
<b>h<sup>2</sup></b>	Heritability
<b>HR</b>	Herd
<b>Kg</b>	Kilogram
<b>M</b>	Month
<b>ML</b>	Month of lactation
<b>MR</b>	Monthly records
<b>MRS</b>	Monthly recording system, where the monthly test- day taken every month of lactation

<b>MT</b>	Recorded 305- day milk traits
<b>MTBRS<sub>2</sub></b>	Simulated 305- day milk traits under BRS <sub>2</sub>
<b>MTFRS<sub>i</sub></b>	Simulated 305- day milk traits under FRS, where $i = 2 ; 3 ; 4$ and 5
<b>MTQRS<sub>i</sub></b>	Simulated 305- day milk traits under QRS, where $i = 2 ; 3$ and 4
<b>MTTRS<sub>i</sub></b>	Simulated 305- day milk traits under trimonthly recording system (TRS), where $i = 2$ and 3
<b>MY</b>	Recorded 305- day milk yield
<b>MYBRS<sub>2</sub></b>	Simulated 305- day milk yield under BRS <sub>2</sub>
<b>MYFRS<sub>i</sub></b>	Simulated 305- day milk yield under FRS, where $i = 2 ; 3 ; 4$ and 5
<b>MYMRS</b>	Simulated 305- day milk yield under MRS
<b>MYQRS<sub>i</sub></b>	Simulated 305- day milk yield under QRS, where $i = 2 ; 3$ and 4
<b>MYT</b>	Recorded 305- day milk yield traits
<b>MYTBRS<sub>2</sub></b>	Simulated 305- day milk yield traits under BRS <sub>2</sub>
<b>MYTFRS<sub>i</sub></b>	Simulated 305- day milk yield traits under FRS, where $i = 2 ; 3 ; 4$ and 5
<b>MYTQRS<sub>i</sub></b>	Simulated 305- day milk yield traits under QRS, where $i = 2 ; 3$ and 4
<b>MYTRS<sub>i</sub></b>	Simulated 305- day milk yield under TRS, where $i = 2$ and 3

- MYTTRS<sub>i</sub>** 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<sub>2</sub>** Simulated 305- day protein yield/ fat yield as a percent under BRS<sub>2</sub>
- POF%FRS<sub>i</sub>** Simulated 305- day protein yield/ fat yield as a percent under FRS , where  $i = 2 ; 3 ; 4$  and  $5$
- POF%QRS<sub>i</sub>** Simulated 305- day protein yield/ fat yield as a percent under QRS , where  $i = 2 ; 3$  and  $4$

<b>POF%TRS<sub>i</sub></b>	Simulated 305- day protein yield/ fat yield as a percent under TRS , where $i = 2$ and $3$
<b>PR</b>	Parity
<b>PSRFPY</b>	Percentages of simulated- 305- day fat-plus- protein yield from recorded one.
<b>PSRFY</b>	Percentages of simulated- 305- day fat yield from recorded one.
<b>PSRMT</b>	Percentages of simulated- 305- day milk traits from recorded one.
<b>PSRMY</b>	Percentages of simulated- 305- day milk yield from recorded one.
<b>PSRMYT</b>	Percentages of simulated- 305- day milk yield traits from recorded one.
<b>PSRPOF%</b>	Percentages of simulated- 305- day protein yield / fat yield from recorded one as percent.
<b>PSRPY</b>	Percentages of simulated- 305- day protein yield from recorded one.
<b>PY</b>	Recorded 305- day protein yield.
<b>PYBRS<sub>2</sub></b>	Simulated 305- day protein yield under BRS <sub>2</sub> .
<b>PYFRS<sub>i</sub></b>	Simulated 305- day protein yield under FRS, where $i = 2 ; 3 ; 4$ and $5$
<b>PYQRS<sub>i</sub></b>	Simulated 305- day protein yield under QRS, where $i = 2 ; 3$ and $4$
<b>PYTRS<sub>i</sub></b>	Simulated 305- day protein yield under TRS, where $i = 2$ and $3$ .

<b>QRS<sub>2</sub></b>	Quadramonthly recording system, where the first monthly test- day started at the second month of lactation
<b>QRS<sub>3</sub></b>	Quadramonthly recording system, where the first monthly test- day started at the third month of lactation.
<b>QRS<sub>4</sub></b>	Quadramonthly recording system, where the first monthly test- day started at the fourth month of lactation.
<b>QRS<sub>i</sub></b>	Quadramonthly recording systems, where $i = 2 ; 3$ and $4$
<b>r<sup>2</sup></b>	Accuracy
<b>r<sub>E</sub></b>	Environmental correlation
<b>r<sub>G</sub></b>	Genetic correlation
<b>RM</b>	Reliability measurements (BMT , PSRMT and PBMT)
<b>r<sub>p</sub></b>	Phenotypic correlation
<b>R<sub>x</sub></b>	Direct response to selection
<b>SD</b>	Standard deviation
<b>SFPY</b>	Simulated 305- day fat- plus- protein yield
<b>SFY</b>	Simulated 305- day fat yield
<b>SL</b>	Stage of lactation
<b>SMT</b>	Simulated 305- day milk traits
<b>SMY</b>	Simulated 305- day milk yield

<b>SMYT</b>	Simulated 305- day milk yield traits
<b>SPOF%</b>	Simulated 305- day protein yield / fat yield as percent
<b>SPY</b>	Simulated 305- day protein yield
<b>STMY</b>	Simulated total milk yield
<b>TD</b>	Monthly test – day
<b>TFTNC</b>	Period from the first monthly test- day to next calving date
<b>TFY</b>	Recorded total fat yield
<b>TFYBRS</b>	Simulated total fat yield under BRS
<b>TFYTRS</b>	Simulated total fat yield under TRS
<b>TMY</b>	Recorded total milk yield
<b>TMYBRS</b>	Simulated total milk yield under BRS
<b>TMYMRS</b>	Simulated total milk yield under MRS
<b>TMYQRS</b>	Simulated total milk yield under QRS
<b>TMYTRS</b>	Simulated total milk yield under TRS
<b>TPY</b>	Recorded total protein yield
<b>TRS<sub>1</sub></b>	Trimonthly recording system, where the first monthly test- day started at the first month of lactation
<b>TRS<sub>2</sub></b>	Trimonthly recording system, where the first monthly test- day started at the second month of lactation

<b>TRS<sub>3</sub></b>	Trimonthly recording system, where the first monthly test- day started at the third month of lactation
<b>TRS<sub>i</sub></b>	Trimonthly recording systems, where $i = 2$ and $3$
<b>V%</b>	Percentage of variance
<b><math>\sigma^2_e</math></b>	Variance due to remainder
<b><math>\sigma^2_s</math></b>	Sire variance component

