Statistics for traditional production model, full and reduced data, Andrei modified model. USN 20220504

At last meeting in the blending group, results from the from traditional model were discussed. It was agreed that similar statistics should be made based on modified test day model by Andrei for RDC. Output and cutoff day were not the same, but the statistic is made as similar as possible. Protein yield in first lactation is analyzed. Correlation between the official run and the modified run for cows born in 2017 with records were 0.94 for DNK cows, 0.92 for FIN cows, and 0.93 for SWE cows.

In analyses for correlations and regressions between offspring, sire and dam, offspring has no own information in reduced data set, and indexes for sire and dam were from the reduced dataset.

Results RDC bulls.

Across countries:

Dependent Variable: proteinindex

Number of Observations Read	271
Number of Observations Used	173
Number of Observations with Missing Values	98

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	2	3325.34612	1662.67306	21.17	<.0001
Error	170	13355	78.55638		
Corrected Total	172	16680			

Root MSE	8.86320	R-Square	0.1994
Dependent Mean	102.10629	Adj R-Sq	0.1899
Coeff Var	8.68037		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
Intercept	1	31.57128	10.98243	2.87	0.0046
sire_p	1	0.39385	0.07684	5.13	<.0001
dam_p	1	0.29675	0.07687	3.86	0.0002

The SAS System   07:40 Monday,

-- nati=DNK -----------------------------------

The REG Procedure
Model: MODEL1
Dependent Variable: proteinindex

Number of Observations Read	45
Number of Observations Used	45

Analysis of Variance

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                                 Sum of          Mean
      Source              DF     Squares        Square    F Value   Pr > F

      Model                2   2254.79939    1127.39970     13.88   <.0001
      Error               42   3410.59749      81.20470
      Corrected Total     44   5665.39689


                Root MSE              9.01137   R-Square     0.3980
                Dependent Mean      102.52562   Adj R-Sq     0.3693
                Coeff Var             8.78938


                            Parameter Estimates

                         Parameter      Standard
      Variable     DF     Estimate         Error    t Value   Pr > |t|

      Intercept     1      0.37599      19.46621       0.02     0.9847
      sire_p        1      0.55287       0.16279       3.40     0.0015
      dam_p         1      0.43154       0.13842       3.12     0.0033

----------------------------------- nati=FIN -----------------------------------
                            The REG Procedure
                              Model: MODEL1
                      Dependent Variable: proteinindex

                    Number of Observations Read         61
                    Number of Observations Used         61


                            Analysis of Variance

                                 Sum of          Mean
      Source              DF     Squares        Square    F Value   Pr > F

      Model                2    358.53423     179.26711      2.08   0.1339
      Error               58   4993.93288      86.10229
      Corrected Total     60   5352.46710


                Root MSE              9.27913   R-Square     0.0670
                Dependent Mean      101.60453   Adj R-Sq     0.0348
                Coeff Var             9.13260


                            Parameter Estimates

                         Parameter      Standard
      Variable     DF     Estimate         Error    t Value   Pr > |t|

      Intercept     1     67.96294      19.50360       3.48     0.0009
      sire_p        1      0.27124       0.13607       1.99     0.0509
      dam_p         1      0.06394       0.13236       0.48     0.6309
                          The SAS System                        07:40 Mond


----------------------------------- nati=SWE -----------------------------------
                            The REG Procedure
                              Model: MODEL1
                      Dependent Variable: proteinindex

                    Number of Observations Read         67
                    Number of Observations Used         67


                            Analysis of Variance

                                 Sum of          Mean
      Source              DF     Squares        Square    F Value   Pr

      Model                2   1297.98614     648.99307      9.57   0.0
      Error               64   4338.75453      67.79304
      Corrected Total     66   5636.74067


                Root MSE              8.23365   R-Square     0.2303
                Dependent Mean      102.28147   Adj R-Sq     0.2062
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           Coeff Var             8.04999


                        Parameter Estimates

                        Parameter      Standard
         Variable     DF   Estimate        Error   t Value   Pr > |t|

         Intercept     1   19.18533     19.22139      1.00     0.3220
         sire_p        1   0.40338       0.11590      3.48     0.0009
         dam_p         1   0.41057       0.13412      3.06     0.0032


                      sire and dam in reduced dataset             07:40 Mond

------------------------------------------- nati=DNK -----------------------------------

                          The CORR Procedure

      6  Variables:    proteinindex sire_p       dam_p        ped_p        dif_p        r2_p


                          Simple Statistics

         Variable        N        Mean      Std Dev          Sum       Minimum

         proteinindex   45    102.52562     11.34720         4614      76.36546      12
         sire_p         45    103.09614      8.58589         4639      76.96708      11
         dam_p          45    104.62671     10.09756         4708      83.56440      11
         ped_p          45    103.86143      7.35590         4674      87.76352      11
         dif_p          45     -1.33581      8.83459    -60.11156     -18.86633       2
         r2_protein      0           .            .            .            .


                    Pearson Correlation Coefficients
                      Prob > |r| under H0: Rho=0
                        Number of Observations

                   proteinindex      sire_p        dam_p        ped_p        dif_p

  proteinindex        1.00000       0.50860      0.48235      0.62789      0.76161
                                     0.0004       0.0008       <.0001       <.0001
                          45            45           45           45           45


  sire_p              0.50860       1.00000      0.23507      0.74495      0.03299
                       0.0004                     0.1201       <.0001       0.8297
                          45            45           45           45           45


  dam_p               0.48235       0.23507      1.00000      0.82354     -0.06617
                       0.0008        0.1201                    <.0001       0.6659
                          45            45           45           45           45


  ped_p               0.62789       0.74495      0.82354      1.00000     -0.02616
                       <.0001        <.0001       <.0001                    0.8645
                          45            45           45           45           45


  dif_p               0.76161       0.03299     -0.06617     -0.02616      1.00000
                       <.0001        0.8297       0.6659       0.8645
                          45            45           45           45           45


  r2_protein                .             .            .            .            .
                            .             .            .            .            .
                            0             0            0            0            0
                      sire and dam in reduced dataset             07:40 Mond

------------------------------------------- nati=FIN -----------------------------------

                          The CORR Procedure

      6  Variables:    proteinindex sire_p       dam_p        ped_p        dif_p        r2_p


                          Simple Statistics

         Variable        N        Mean      Std Dev          Sum       Minimum

         proteinindex   61    101.60453      9.44499         6198      73.61322      12
         sire_p         61     99.72939      8.80608         6083      76.96708      12
         dam_p          61    103.08376      9.05282         6288      64.19438      12
         ped_p          61    101.40657      6.24049         6186      82.50851      11
         dif_p          61      0.19796     10.12433     12.07548     -24.72110       2
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        r2_protein            0          .          .          .          .


                       Pearson Correlation Coefficients
                          Prob > |r| under H0: Rho=0
                            Number of Observations

                    proteinindex    sire_p       dam_p        ped_p        dif_p

proteinindex          1.00000      0.25146      0.05538      0.21758      0.79878
                                    0.0506       0.6717       0.0921       <.0001
                           61           61           61           61           61


sire_p                0.25146      1.00000     -0.02337      0.68861     -0.18987
                       0.0506                    0.8581       <.0001       0.1428
                           61           61           61           61           61


dam_p                 0.05538     -0.02337      1.00000      0.70884     -0.38526
                       0.6717       0.8581                    <.0001       0.0022
                           61           61           61           61           61


ped_p                 0.21758      0.68861      0.70884      1.00000     -0.41340
                       0.0921       <.0001       <.0001                    0.0009
                           61           61           61           61           61


dif_p                 0.79878     -0.18987     -0.38526     -0.41340      1.00000
                       <.0001       0.1428       0.0022       0.0009
                           61           61           61           61           61


r2_protein                .            .            .            .            .
                          .            .            .            .            .
                          0            0            0            0            0
                            sire and dam in reduced dataset         07:40 Mond

------------------------------------------ nati=SWE -----------------------------------

                              The CORR Procedure

    6  Variables:    proteinindex sire_p     dam_p        ped_p        dif_p        r2_p


                              Simple Statistics

        Variable         N          Mean      Std Dev          Sum      Minimum

        proteinindex    67     102.28147      9.24149         6853     83.53752      11
        sire_p          67     100.99201      8.81224         6766     79.63144      12
        dam_p           67     103.17016      7.61462         6912     86.84699      11
        ped_p           67     102.08108      5.45609         6839     87.73802      11
        dif_p           67       0.20039      8.17217     13.42591    -13.97668       1
        r2_protein       0             .            .            .            .


                       Pearson Correlation Coefficients
                          Prob > |r| under H0: Rho=0
                            Number of Observations

                    proteinindex    sire_p       dam_p        ped_p        dif_p

proteinindex          1.00000      0.34289      0.29082      0.47984      0.81049
                                    0.0045       0.0170       <.0001       <.0001
                           67           67           67           67           67


sire_p                0.34289      1.00000     -0.12341      0.72144     -0.09391
                       0.0045                    0.3197       <.0001       0.4497
                           67           67           67           67           67


dam_p                 0.29082     -0.12341      1.00000      0.59815     -0.07047
                       0.0170       0.3197                    <.0001       0.5709
                           67           67           67           67           67


ped_p                 0.47984      0.72144      0.59815      1.00000     -0.12501
                       <.0001       <.0001       <.0001                    0.3135
                           67           67           67           67           67


dif_p                 0.81049     -0.09391     -0.07047     -0.12501      1.00000
                       <.0001       0.4497       0.5709       0.3135
                           67           67           67           67           67


r2_protein                .            .            .            .            .
                          .            .            .            .            .
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Females:

-- nati=DNK --

The CORR Procedure

6 Variables: proteinindex sire_p   dam_p   ped_p   dif_p   r2_protein

Simple Statistics

Variable	N	Mean	Std Dev	Sum	Minimum	Maximum
proteinindex	2899	100.81977	8.53350	292277	70.16809	134.34414
sire_p	2899	103.29507	8.96601	299452	64.12201	121.64568
dam_p	2899	98.09371	7.61700	284374	69.85429	126.59716
ped_p	2899	100.69439	6.14715	291913	70.59748	121.22444
dif_p	2899	0.12538	7.07965	363.47560	-24.00727	30.29256
r2_protein	0	.	.	.	.	.

Pearson Correlation Coefficients
Prob > |r| under H0: Rho=0
Number of Observations

	proteinindex	sire_p	dam_p	ped_p	dif_p	r2_protein
proteinindex	1.00000	0.36619	0.49953	0.57654	0.70476	.
		<.0001	<.0001	<.0001	<.0001	.
	2899	2899	2899	2899	2899	0
sire_p	0.36619	1.00000	0.09329	0.78708	-0.24202	.
	<.0001		<.0001	<.0001	<.0001	.
	2899	2899	2899	2899	2899	0
dam_p	0.49953	0.09329	1.00000	0.68759	0.00509	.
	<.0001	<.0001		<.0001	0.7842	.
	2899	2899	2899	2899	2899	0
ped_p	0.57654	0.78708	0.68759	1.00000	-0.17335	.
	<.0001	<.0001	<.0001		<.0001	.
	2899	2899	2899	2899	2899	0
dif_p	0.70476	-0.24202	0.00509	-0.17335	1.00000	.
	<.0001	<.0001	0.7842	<.0001		.
	2899	2899	2899	2899	2899	0
r2_protein	.	.	.	.	.	.
	.	.	.	.	.	.
	0	0	0	0	0	0

-- nati=FIN --

The CORR Procedure

6 Variables: proteinindex sire_p   dam_p   ped_p   dif_p   r2_protein

Simple Statistics

Variable	N	Mean	Std Dev	Sum	Minimum	Maximum
proteinindex	12830	96.54169	11.44399	1238630	60.02248	140.81133
sire_p	12830	98.42284	13.95547	1262765	51.09475	121.64568
dam_p	12830	96.23159	10.02252	1234651	60.06393	138.86130
ped_p	12830	97.32721	9.33565	1248708	60.12198	125.42426
dif_p	12830	-0.78552	7.61162	-10078	-39.16861	44.09116
r2_protein	0	.	.	.	.	.

Pearson Correlation Coefficients

	proteinindex	sire_p	dam_p	ped_p	dif_p	r2_protein
proteinindex	1.00000	0.63941	0.50625	0.74966	0.58403	.
		<.0001	<.0001	<.0001	<.0001	.
	12830	12830	12830	12830	12830	0
sire_p	0.63941	1.00000	0.19093	0.84992	-0.08109	.
	<.0001		<.0001	<.0001	<.0001	.
	12830	12830	12830	12830	12830	0
dam_p	0.50625	0.19093	1.00000	0.67950	-0.07226	.
	<.0001	<.0001		<.0001	<.0001	.
	12830	12830	12830	12830	12830	0
ped_p	0.74966	0.84992	0.67950	1.00000	-0.09940	.
	<.0001	<.0001	<.0001		<.0001	.
	12830	12830	12830	12830	12830	0
dif_p	0.58403	-0.08109	-0.07226	-0.09940	1.00000	.
	<.0001	<.0001	<.0001	<.0001		.
	12830	12830	12830	12830	12830	0
r2_protein	.	.	.	.	.	.
	.	.	.	.	.	.
	0	0	0	0	0	0

-- nati=SWE --

The CORR Procedure

6 Variables: proteinindex sire_p   dam_p   ped_p   dif_p   r2_protein

Simple Statistics

Variable	N	Mean	Std Dev	Sum	Minimum	Maximum
proteinindex	10615	98.90821	9.60519	1049911	61.13518	148.46639
sire_p	10615	102.64060	13.12818	1089530	59.61741	121.64568
dam_p	10615	96.60578	8.32048	1025470	62.83971	136.80749
ped_p	10615	99.62319	8.09742	1057500	68.25298	127.97265
dif_p	10615	-0.71498	6.33389	-7589	-27.58661	34.80998
r2_protein	0	.	.	.	.	.

Pearson Correlation Coefficients
Prob > |r| under H0: Rho=0
Number of Observations

	proteinindex	sire_p	dam_p	ped_p	dif_p	r2_protein
proteinindex	1.00000	0.62245	0.49073	0.75671	0.54908	.
		<.0001	<.0001	<.0001	<.0001	.
	10615	10615	10615	10615	10615	0
sire_p	0.62245	1.00000	0.09472	0.85930	-0.15462	.
	<.0001		<.0001	<.0001	<.0001	.
	10615	10615	10615	10615	10615	0
dam_p	0.49073	0.09472	1.00000	0.59056	-0.01081	.
	<.0001	<.0001		<.0001	0.2656	.
	10615	10615	10615	10615	10615	0
ped_p	0.75671	0.85930	0.59056	1.00000	-0.13089	.
	<.0001	<.0001	<.0001		<.0001	.
	10615	10615	10615	10615	10615	0
dif_p	0.54908	-0.15462	-0.01081	-0.13089	1.00000	.
	<.0001	<.0001	0.2656	<.0001		.
	10615	10615	10615	10615	10615	0