



Factor analysis for udder and teat type traits in Sahiwal and Karan Fries cows

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Supplementary Table 1. Total variance explained by different components in Sahiwal cows

Component	Initial eigenvalues			Extraction sum of squared loadings			Rotation sum of squared loadings
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %	Total
1	3.306	19.446	19.446	2.855	16.796	16.796	2.601
2	2.494	14.672	34.118	2.048	12.046	28.842	2.160
3	2.136	12.564	46.682	1.694	9.964	38.807	1.448
4	1.530	8.999	55.681	1.070	6.297	45.103	1.411
5	1.113	6.549	62.229	0.503	2.959	48.062	0.551
6	0.978	5.753	67.982				
7	0.829	4.875	72.857				
8	0.759	4.463	77.320				
9	0.653	3.843	81.163				
10	0.608	3.576	84.739				
11	0.580	3.410	88.149				
12	0.453	2.663	90.812				
13	0.397	2.333	93.145				
14	0.344	2.022	95.167				
15	0.320	1.880	97.047				
16	0.280	1.649	98.696				
17	0.222	1.304	100.000				

Extraction method, principal axis factoring.

Supplementary Table 2. Total variance explained by different components in Karan Fries cows

Component	Initial eigenvalues			Extraction sum of squared loadings			Rotation sum of squared loadings
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %	Total
1	4.401	25.891	25.891	4.020	23.646	23.646	3.062
2	2.153	12.667	38.558	1.637	9.630	33.276	2.226
3	1.784	10.496	49.054	1.386	8.155	41.431	1.646
4	1.503	8.843	57.897	0.991	5.832	47.263	0.962
5	1.323	7.779	65.677	0.802	4.718	51.981	0.940
6	0.940	5.528	71.205				
7	0.862	5.069	76.274				
8	0.668	3.931	80.205				
9	0.621	3.651	83.856				
10	0.591	3.478	87.334				
11	0.433	2.549	89.883				
12	0.401	2.359	92.242				
13	0.374	2.199	94.441				
14	0.320	1.882	96.323				
15	0.291	1.714	98.037				
16	0.176	1.035	99.072				
17	0.158	0.928	100.000				

Extraction method, principal axis factoring.

Supplementary Table 3. Varimax rotated component matrix of different factors for udder and teat traits in Sahiwal cows

Trait	Factor				
	1	2	3	4	5
FUA	-0.118	0.171	0.088	0.193	0.402
RUH	-0.082	0.205	0.455	0.408	0.004
RUW	-0.195	0.472	0.620	0.520	-0.127
UL	0.732	-0.210	0.268	-0.049	0.008
UW	0.680	-0.184	0.336	-0.128	-0.097
UC	0.107	0.517	0.129	-0.393	-0.080
UD	-0.508	0.510	0.116	-0.193	-0.090
UB	0.093	0.022	-0.170	0.137	0.075
CL	0.631	-0.132	0.023	0.188	-0.245
TT	0.239	0.370	-0.260	-0.129	0.067
FTL	0.567	0.434	-0.229	0.202	0.203
RTL	0.438	0.314	-0.455	0.195	0.124
DFR	0.229	0.056	0.445	-0.242	0.361
DLR	-0.038	0.254	0.440	-0.412	0.058
SDF	-0.589	-0.276	-0.149	0.018	0.076
SDR	-0.382	-0.276	0.042	0.078	0.103
TD	-0.073	0.697	-0.329	-0.041	-0.158

Extraction method, principal axis factoring; Rotation method, varimax with Kaiser normalization.

Supplementary Table 4. Varimax rotated component matrix of different factors for udder and teat traits in Karan Fries cows

Trait	Factor				
	1	2	3	4	5
FUA	-0.058	-0.085	-0.108	0.017	0.594
RUH	-0.305	0.149	-0.220	-0.010	-0.195
RUW	0.026	0.064	0.522	0.026	0.011
UL	0.587	0.226	-0.012	-0.331	0.071
UW	0.815	0.140	0.018	0.035	0.073
UC	0.250	0.160	0.364	-0.211	0.659
UD	-0.048	-0.196	0.416	0.560	0.059
UB	0.052	0.028	-0.129	0.509	-0.068
CL	0.272	0.241	-0.450	0.293	-0.032
TT	0.475	0.549	0.171	-0.040	-0.180
FTL	0.087	0.860	0.054	-0.094	0.036
RTL	0.146	0.800	0.023	0.034	-0.033
DFR	0.473	0.031	-0.341	0.045	-0.103
DLR	0.579	-0.099	0.342	-0.181	-0.143
SDF	-0.602	-0.329	0.014	-0.133	-0.164
SDR	-0.765	-0.268	-0.044	-0.285	0.005
TD	0.231	0.357	0.721	-0.032	-0.057

Extraction method, principal axis factoring; Rotation method, varimax with Kaiser normalisation.

Supplementary Table 5. Communalities in Sahiwal and Karan Fries cows

Trait	Sahiwal		Karan Fries	
	Initial	Extraction	Initial	Extraction
FUA	0.144	0.250	0.273	0.375
RUH	0.453	0.422	0.229	0.202
RUW	0.548	0.931	0.292	0.279
UL	0.585	0.655	0.547	0.511
UW	0.536	0.634	0.641	0.690
UC	0.408	0.457	0.473	0.699
UD	0.546	0.577	0.348	0.531
UB	0.099	0.062	0.271	0.284
CL	0.433	0.511	0.379	0.422
TT	0.309	0.283	0.568	0.591
FTL	0.516	0.645	0.670	0.760
RTL	0.466	0.551	0.671	0.664
DFR	0.278	0.443	0.450	0.353
DLR	0.349	0.432	0.418	0.516
SDF	0.429	0.451	0.657	0.515
SDR	0.245	0.241	0.666	0.740
TD	0.525	0.626	0.588	0.705

Extraction method, principal axis factoring.

Table 7. Multiple linear regression by using factors for prediction of 305-d milk yield in Karan Fries cows

Trait	Adjusted R square	P-value	P-value (Bonferroni correction)
FUA	-0.006	0.624	Non-significant
RUH	0.010	0.264	Non-significant
RUW	-0.007	0.720	Non-significant
UL	0.000	0.970	Non-significant
UW	0.021	0.109	Non-significant
UC	0.013	0.203	Non-significant
UD	0.000	0.939	Non-significant
UB	0.002	0.649	Non-significant
CL	0.002	0.604	Non-significant
TT	-0.007	0.683	Non-significant
FTL	-0.008	0.783	Non-significant
RTL	-0.004	0.485	Non-significant
DFR	0.031	0.050	Non-significant
DLR	-0.008	0.894	Non-significant
SDF	0.035	0.04	Non-significant
SDR	0.015	0.181	Non-significant
TD	0.003	0.564	Non-significant

Bonferroni significance threshold was 0.0029 for P-value. None of P-value cross that mark.

Supplementary Table 6. Multiple linear regressions by using factors for prediction of 305-d milk yield in Sahiwal Cows

Trait	Adjusted R square	P-value	P-value (Bonferroni correction)
FUA	0.011	0.11	Non-significant
RUH	-0.006	0.63	Non-significant
RUW	-0.001	0.35	Non-significant
UL	0.042	0.010	Non-significant
UW	0.056	0.004	Non-significant
UC	0.013	0.098	Non-significant
UD	0.008	0.155	Non-significant
UB	-0.004	0.508	Non-significant
CL	0.027	0.032	Non-significant
TT	0.008	0.148	Non-significant
FTL	-0.004	0.496	Non-significant
RTL	0.027	0.204	Non-significant
DFR	0.008	0.086	Non-significant
DLR	-0.004	0.072	Non-significant
SDF	0.005	0.067	Non-significant
SDR	0.015	0.780	Non-significant
TD	0.017	0.092	Non-significant

The bonferroni significance threshold was 0.0029 for P-value. None of P-value cross that mark.