

**ADJUSTMENT FACTORS FOR PROBE MEASUREMENTS AT 100 KG
FROM DATA RECORDED ON PUREBRED PIGS
(DESCHAMBAULT TESTS 17 AND 18)
SUMMARY**

CCSI, November 2006

Adjustment factors for backfat (3rd / 4th ribs)

Breed	Sex	Estimated from tests 17-18		Used since 1999	
		A ₁₀₀	B	A ₁₀₀	B
Yorkshire	Male	11.14	0.0800	12.40	0.1065
	Female	12.48	0.1024	13.71	0.1196
	Castrate	14.97	0.1480	15.71	0.1130
Landrace	Male	11.84	0.0859	12.83	0.1144
	Female	12.98	0.1164	13.98	0.1260
	Castrate	14.68	0.1469	15.98	0.1202
Duroc	Male	11.39	0.0977	13.47	0.1115
	Female	12.47	0.0791	15.65	0.1566
	Castrate	13.92	0.1254	17.65	0.1340

Backfat adjusted to 100 kg = Backfat $\times \frac{A_{100}}{A_{100} + B(\text{Weight} - 100)}$

Adjustment factors for lean depth (3rd / 4th ribs)

Breed	Sex	Estimated from tests 17-18		Used since 1999	
		A ₁₀₀	B	A ₁₀₀	B
Yorkshire	Male	59.98	0.3066	51.42	0.260
	Female	62.75	0.2895	53.03	0.260
	Castrate	59.51	0.2851	49.92	0.260
Landrace	Male	59.83	0.2525	49.45	0.177
	Female	62.37	0.2520	50.31	0.177
	Castrate	59.83	0.2747	47.95	0.177
Duroc	Male	62.57	0.3091	50.52	0.228
	Female	63.80	0.2602	52.01	0.228
	Castrate	62.59	0.2951	49.02	0.228

Lean depth adjusted to 100 kg = Lean depth $\times \frac{A_{100}}{A_{100} + B(\text{Weight} - 100)}$

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INTRODUCTION

Backfat and loin depth ultrasound records are currently adjusted to 100 kg live weight in the Canadian Swine Improvement Program, and used to compute EBVs for Backfat to 100kg, Loin muscle depth to 100kg, and other EBVs for carcass and feed efficiency traits. The adjustment factors used currently were computed in 1999. Because of selection it is necessary to review them on a regular basis and update them if necessary. This report provides some statistics on recent data collected on purebred pigs tested at Deschambault station.

MATERIAL AND METHOD

Data

Data used were recorded on purebred pigs tested in Deschambault station, Quebec, in 2004 and 2005. In total 431 pigs from four different breeds (Duroc, Landrace, Yorkshire) originating from 26 breeding farms across Canada were sent to the station at about 10 days of age, and raised till slaughter, at 107 or 125 kg live weight. During the fattening phase, pigs were probed several times using an Ultrascan 50 or VetkoPlus equipment. The pigs available for this analysis were weighed every week, and probed every two weeks for backfat and loin muscle depth. Pigs were then weighed 3 to 12 times (on average 6.6 times) and probed 2 to 7 times between 75 and 130 kg live weight (on average 3.9 times). Table 1 provides the number of animals and weight/probe records available for each breed and sex.

Table 1. Number of pigs and probe records (between brackets) by breed and sex

Breed	Sex	#pigs	# weight records	# probe records
Yorkshire	Male	59	450	224
	Female	87	594	345
	Castrate	69	368	269
Landrace	Male	39	262	155
	Female	41	291	161
	Castrate	41	260	151
Duroc	Male	27	173	124
	Female	36	239	143
	Castrate	32	205	101

ANALYSIS

a) Adjustment of backfat to 100 kg

Backfat records, measured between the 3rd and 4th last ribs following CSIP guidelines, were adjusted to account for machine calibration and analyzed within each breed according to the following model:

$$\text{Fat}_{ijk} = \mu + \text{sex}_j + b_j \times (\text{wt}_{ijk} - 100) + e_{ijk}$$

where fat_{ijk} is the unadjusted backfat of the ijk^{th} pig,
 sex_j the effect of the j^{th} sex (male, female or castrate),
 b_j is the regression of fat on probe weight wt_{ijk} within sex j
 e_{ijk} is a random error

b) Adjustment of lean depth to 100 kg

Loin depth records, measured between the 3rd and 4th last ribs following CSIP guidelines, were adjusted to account for machine calibration and analyzed within each breed according to the following model:

$$\text{Lean}_{ijk} = \mu + \text{sex}_j + b_j \times (\text{wt}_{ijk} - 100) + e_{ijk}$$

where Lean_{ijk} is the unadjusted loin muscle depth of the ijk^{th} pig,
 sex_j the effect of the j^{th} sex (male, female or castrate),
 b_j is the regression of lean depth on probe weight wt_{ijk} within sex j
 e_{ijk} is a random error

RESULTS

Following are newly estimated weight adjustment factors from the Heavier Carcass Weight Project using repeated measurements on purebred pigs at the Deschambault test station. Adjustment factors for fat and lean depth are presented in tables 2 and 3, respectively. The factors currently used (since 1999) in the Canadian Swine Improvement Program are also given for information. Adjustment factors are provided for a 100 kg standard live weight but also for 90, 110 and 120 kg for information.

For backfat, there are major changes both in the intercept (A) and slope (B) for all breeds and sexes. Both are lower than in the previous estimations, which is consistent with selection trends. On lean depth, we can see the opposite trend, with both intercept and slope higher than before, which is also consistent with genetic trends, resulting in leaner pigs showing faster lean deposition.

Table 2. Adjustment factors for backfat (3rd / 4th ribs)

Breed	Sex	#records	Estimated from tests 17-18					Used since 1999	
			A ₉₀	A ₁₀₀	A ₁₁₀	A ₁₂₀	B	A ₁₀₀	B
Yorkshire	Male	269	10.34	11.14	11.94	12.74	0.0800	12.40	0.1065
	Female	345	11.46	12.48	13.51	14.53	0.1024	13.71	0.1196
	Castrate	224	13.49	14.97	16.45	17.93	0.1480	15.71	0.1130
Landrace	Male	151	10.95	11.84	12.66	13.52	0.0859	12.83	0.1144
	Female	161	11.82	12.98	14.14	15.31	0.1164	13.98	0.1260
	Castrate	155	13.22	14.68	16.15	17.62	0.1469	15.98	0.1202
Duroc	Male	101	10.42	11.39	12.37	13.35	0.0977	13.47	0.1115
	Female	143	11.68	12.47	13.27	14.06	0.0791	15.65	0.1566
	Castrate	124	12.66	13.92	15.17	16.42	0.1254	17.65	0.1340

Backfat adjusted to λ kg = Backfat $\times \frac{A_{\lambda}}{A_{\lambda} + B (\text{Weight} - \lambda)}$

Table 3. Adjustment factors for lean depth (3rd / 4th ribs)

Breed	Sex	#records	Estimated from tests 17-18					Used since 1999	
			A ₉₀	A ₁₀₀	A ₁₁₀	A ₁₂₀	B	A ₁₀₀	B
Yorkshire	Male	269	56.92	59.98	63.05	68.11	0.3066	51.42	0.260
	Female	345	59.86	62.75	65.65	68.55	0.2895	53.03	0.260
	Castrate	224	56.66	59.51	62.37	65.22	0.2851	49.92	0.260
Landrace	Male	151	57.78	59.83	62.83	65.36	0.2525	49.45	0.177
	Female	161	59.85	62.37	64.89	67.40	0.2520	50.31	0.177
	Castrate	155	57.09	59.83	62.58	65.33	0.2747	47.95	0.177
Duroc	Male	101	59.06	62.57	65.24	68.33	0.3091	50.52	0.228
	Female	143	61.19	63.80	66.40	69.00	0.2602	52.01	0.228
	Castrate	124	59.62	62.59	65.52	66.47	0.2951	49.02	0.228

Lean depth adjusted to λ kg = Lean depth $\times \frac{A_{\lambda}}{A_{\lambda} + B (\text{Weight} - \lambda)}$

Accuracy of the adjustment according to probe weight

In the Canadian Swine Improvement Program, the current weight range to evaluate pigs is 75-130 kg. It is recommended to probe pigs close to 100 kg when possible, but the adjustment factors to 100kg aim at ranking animals probed at either lighter or heavier weights. Table 4 and 5 give the correlation and average bias of predicted fat and lean at 100 kg compared to the actual fat and lean at 100 kg available in the data set thanks to repeated measurements. In each table the statistics are provided for the predictions using current adjustment factors or the new factors estimated from the data set. In most cases the new parameters give a better correlation with the actual measure at 100kg, however the bias is not always smaller, probably due to higher prediction errors variance.

Table 4. Correlations between predicted and actual backfat at 100 kg according to weight at probing

Breed	Adjustment Factors		Correlation(1) and bias between backfat adjusted to 100kg and actual backfat at 100kg(2) when probe weight is within			
			75-90kg	90-110kg	110-130kg	75-130kg
Yorkshire	Current	Correlation	0.843	0.960	0.887	0.903
		Bias (mm)	-0.018	0.068	-0.072	0.013
	New	Correlation	0.869	0.961	0.872	0.910
		Bias (mm)	0.026	0.060	-0.116	0.017
Landrace	Current	Correlation	0.801	0.945	0.851	0.879
		Bias (mm)	-0.269	0.032	0.158	-0.034
	New	Correlation	0.830	0.947	0.857	0.890
		Bias (mm)	-0.128	0.028	0.057	-0.011
Duroc	Current	Correlation	0.647	0.893	0.785	0.784
		Bias (mm)	0.259	0.024	-0.344	0.020
	New	Correlation	0.680	0.895	0.795	0.799
		Bias (mm)	0.082	0.026	-0.221	-0.010
All breeds	Current	Correlation	0.801	0.944	0.857	0.877
		Bias (mm)	-0.027	0.048	-0.071	0.002
	New	Correlation	0.832	0.946	0.867	0.886
		Bias (mm)	-0.004	0.043	-0.092	0.003

(1) Spearman correlations

(2) Computed by interpolation using the two records closest to 100 kg

Table 5. Correlations between predicted and actual loin muscle depth at 100 kg according to weight at probing

Breed	Adjustment Factors		Correlation(1) and bias between backfat adjusted to 100kg and actual backfat at 100kg(2) when probe weight is within			
			75-90kg	90-110kg	110-130kg	75-130kg
Yorkshire	Current	Correlation	0.731	0.919	0.772	0.821
		Bias (mm)	0.218	0.073	-0.175	0.059
	New	Correlation	0.734	0.920	0.772	0.822
		Bias (mm)	-0.039	0.075	0.038	0.013
Landrace	Current	Correlation	0.709	0.844	0.701	0.750
		Bias (mm)	-1.455	-0.112	0.612	-0.404
	New	Correlation	0.695	0.846	0.709	0.757
		Bias (mm)	-0.647	-0.118	-0.101	-0.287
Duroc	Current	Correlation	0.654	0.879	0.620	0.738
		Bias (mm)	0.159	-0.185	-0.031	-0.041
	New	Correlation	0.647	0.880	0.624	0.741
		Bias (mm)	0.195	-0.184	-0.054	-0.033
All breeds	Current	Correlation	0.712	0.895	0.733	0.794
		Bias (mm)	-0.257	-0.036	0.083	-0.093
	New	Correlation	0.713	0.896	0.738	0.796
		Bias (mm)	-0.156	-0.036	-0.023	-0.082

(3) Spearman correlations

(4) Computed by interpolation using the two records closest to 100 kg

Examples of weight adjustment for Backfat thickness

Weight (kg)		75				
Raw Backfat (mm)		5	7.5	10	12.5	15
Current factors						
YO	M	6.367	9.551	12.734	15.918	19.101
YO	F	6.395	9.592	12.789	15.986	19.184
YO	C	6.096	9.144	12.192	15.241	18.289
LA	M	6.434	9.651	12.869	16.086	19.303
LA	F	6.454	9.681	12.909	16.136	19.363
LA	C	6.158	9.237	12.316	15.395	18.474
DU	M	6.305	9.457	12.609	15.762	18.914
DU	F	6.668	10.002	13.336	16.670	20.004
DU	C	6.171	9.257	12.343	15.428	18.514
New factors						
YO	M	6.094	9.141	12.188	15.235	18.282
YO	F	6.290	9.435	12.581	15.726	18.871
YO	C	6.642	9.962	13.283	16.604	19.925
LA	M	6.108	9.162	12.216	15.270	18.323
LA	F	6.445	9.667	12.890	16.112	19.335
LA	C	6.668	10.002	13.336	16.670	20.005
DU	M	6.365	9.547	12.730	15.912	19.095
DU	F	5.942	8.914	11.885	14.856	17.827
DU	C	6.453	9.680	12.907	16.134	19.360
Difference						
YO	M	-0.273	-0.410	-0.546	-0.683	-0.819
YO	F	-0.104	-0.156	-0.209	-0.261	-0.313
YO	C	0.545	0.818	1.091	1.363	1.636
LA	M	-0.326	-0.490	-0.653	-0.816	-0.979
LA	F	-0.009	-0.014	-0.019	-0.024	-0.028
LA	C	0.510	0.765	1.020	1.275	1.531
DU	M	0.060	0.090	0.120	0.151	0.181
DU	F	-0.726	-1.089	-1.451	-1.814	-2.177
DU	C	0.282	0.423	0.564	0.705	0.846

Examples of weight adjustment for Backfat thickness

Probe weight (kg)		90				
Raw Backfat (mm)		5	7.5	10	12.5	15
Current factors						
YO	M	5.470	8.205	10.940	13.674	16.409
YO	F	5.478	8.217	10.956	13.695	16.434
YO	C	5.388	8.081	10.775	13.469	16.163
LA	M	5.489	8.234	10.979	13.724	16.468
LA	F	5.495	8.243	10.991	13.738	16.486
LA	C	5.407	8.110	10.813	13.517	16.220
DU	M	5.451	8.177	10.902	13.628	16.354
DU	F	5.556	8.334	11.112	13.890	16.668
DU	C	5.411	8.116	10.822	13.527	16.232
New factors						
YO	M	5.387	8.080	10.774	13.467	16.161
YO	F	5.447	8.170	10.894	13.617	16.341
YO	C	5.549	8.323	11.097	13.871	16.646
LA	M	5.391	8.087	10.782	13.478	16.173
LA	F	5.493	8.239	10.985	13.731	16.478
LA	C	5.556	8.334	11.112	13.890	16.668
DU	M	5.469	8.204	10.938	13.673	16.407
DU	F	5.339	8.008	10.677	13.347	16.016
DU	C	5.495	8.243	10.990	13.738	16.485
Difference						
YO	M	-0.083	-0.124	-0.166	-0.207	-0.249
YO	F	-0.031	-0.046	-0.062	-0.077	-0.093
YO	C	0.161	0.242	0.322	0.403	0.483
LA	M	-0.098	-0.148	-0.197	-0.246	-0.295
LA	F	-0.003	-0.004	-0.005	-0.007	-0.008
LA	C	0.149	0.224	0.299	0.373	0.448
DU	M	0.018	0.027	0.036	0.045	0.054
DU	F	-0.217	-0.326	-0.435	-0.543	-0.652
DU	C	0.084	0.126	0.168	0.211	0.253

Examples of weight adjustment for Backfat thickness

Probe weight (kg)		110				
Raw Backfat (mm)		5	7.5	10	12.5	15
Current factors						
YO	M	4.605	6.907	9.209	11.511	13.814
YO	F	4.599	6.898	9.198	11.497	13.796
YO	C	4.664	6.997	9.329	11.661	13.993
LA	M	4.591	6.886	9.181	11.477	13.772
LA	F	4.587	6.880	9.173	11.467	13.760
LA	C	4.650	6.975	9.300	11.626	13.951
DU	M	4.618	6.927	9.236	11.544	13.853
DU	F	4.545	6.818	9.090	11.363	13.636
DU	C	4.647	6.971	9.294	11.618	13.942
New factors						
YO	M	4.665	6.997	9.330	11.662	13.995
YO	F	4.621	6.931	9.242	11.552	13.863
YO	C	4.550	6.825	9.100	11.375	13.650
LA	M	4.662	6.993	9.324	11.654	13.985
LA	F	4.589	6.883	9.177	11.471	13.766
LA	C	4.545	6.818	9.090	11.363	13.636
DU	M	4.605	6.907	9.210	11.512	13.815
DU	F	4.702	7.053	9.404	11.754	14.105
DU	C	4.587	6.880	9.174	11.467	13.760
Difference						
YO	M	0.060	0.091	0.121	0.151	0.181
YO	F	0.022	0.033	0.044	0.055	0.066
YO	C	-0.114	-0.172	-0.229	-0.286	-0.343
LA	M	0.071	0.107	0.142	0.178	0.213
LA	F	0.002	0.003	0.004	0.005	0.006
LA	C	-0.105	-0.158	-0.210	-0.263	-0.315
DU	M	-0.013	-0.019	-0.026	-0.032	-0.038
DU	F	0.157	0.235	0.313	0.391	0.470
DU	C	-0.060	-0.091	-0.121	-0.151	-0.181

Examples of weight adjustment for Backfat thickness

Probe weight (kg)		125				
Raw Backfat (mm)		5	7.5	10	12.5	15
Current factors						
YO	M	4.116	6.174	8.232	10.290	12.349
YO	F	4.105	6.157	8.210	10.262	12.314
YO	C	4.238	6.357	8.476	10.595	12.714
LA	M	4.089	6.133	8.177	10.221	12.266
LA	F	4.081	6.121	8.161	10.201	12.242
LA	C	4.209	6.313	8.417	10.521	12.626
DU	M	4.143	6.214	8.285	10.357	12.428
DU	F	3.999	5.999	7.999	9.999	11.998
DU	C	4.202	6.304	8.405	10.506	12.607
New factors						
YO	M	4.239	6.358	8.478	10.597	12.717
YO	F	4.149	6.223	8.298	10.372	12.447
YO	C	4.009	6.014	8.018	10.023	12.027
LA	M	4.232	6.349	8.465	10.581	12.697
LA	F	4.084	6.126	8.169	10.211	12.253
LA	C	3.999	5.999	7.999	9.999	11.998
DU	M	4.117	6.176	8.234	10.293	12.351
DU	F	4.316	6.473	8.631	10.789	12.947
DU	C	4.081	6.121	8.162	10.202	12.243
Difference (mm)						
YO	M	0.123	0.184	0.246	0.307	0.368
YO	F	0.044	0.066	0.088	0.110	0.132
YO	C	-0.229	-0.343	-0.458	-0.572	-0.686
LA	M	0.144	0.216	0.288	0.359	0.431
LA	F	0.004	0.006	0.008	0.009	0.011
LA	C	-0.209	-0.314	-0.418	-0.523	-0.627
DU	M	-0.026	-0.038	-0.051	-0.064	-0.077
DU	F	0.316	0.474	0.632	0.790	0.948
DU	C	-0.121	-0.182	-0.243	-0.304	-0.364

Examples of weight adjustment for Loin muscle depth

Probe weight (kg)		75				
Raw Lean depth (mm)		50	55	60	65	70
Current factors						
YO	M	57.235	62.959	68.682	74.406	80.129
YO	F	56.985	62.683	68.382	74.080	79.779
YO	C	57.485	63.234	68.982	74.731	80.479
LA	M	54.914	60.405	65.897	71.388	76.880
LA	F	54.822	60.304	65.786	71.268	76.751
LA	C	55.083	60.592	66.100	71.608	77.117
DU	M	56.359	61.995	67.631	73.266	78.902
DU	F	56.154	61.770	67.385	73.000	78.616
DU	C	56.579	62.237	67.895	73.553	79.211
New factors						
YO	M	57.326	63.058	68.791	74.524	80.256
YO	F	56.519	62.171	67.823	73.474	79.126
YO	C	56.803	62.484	68.164	73.844	79.525
LA	M	55.898	61.487	67.077	72.667	78.257
LA	F	55.618	61.180	66.742	72.303	77.865
LA	C	56.483	62.132	67.780	73.428	79.077
DU	M	57.045	62.750	68.454	74.159	79.863
DU	F	55.677	61.244	66.812	72.380	77.947
DU	C	56.681	62.349	68.017	73.685	79.353
Difference						
YO	M	0.091	0.100	0.109	0.118	0.127
YO	F	-0.466	-0.513	-0.559	-0.606	-0.652
YO	C	-0.682	-0.750	-0.818	-0.886	-0.954
LA	M	0.984	1.082	1.180	1.279	1.377
LA	F	0.796	0.876	0.955	1.035	1.115
LA	C	1.400	1.540	1.680	1.820	1.960
DU	M	0.686	0.755	0.824	0.892	0.961
DU	F	-0.477	-0.525	-0.573	-0.621	-0.668
DU	C	0.102	0.112	0.122	0.133	0.143

Examples of weight adjustment for Loin muscle depth

Probe weight (kg)		90				
Raw Lean depth (mm)		50	55	60	65	70
Current factors						
YO	M	52.663	57.929	63.195	68.462	73.728
YO	F	52.578	57.836	63.093	68.351	73.609
YO	C	52.747	58.022	63.297	68.571	73.846
LA	M	51.856	57.042	62.227	67.413	72.599
LA	F	51.823	57.006	62.188	67.370	72.553
LA	C	51.916	57.108	62.300	67.491	72.683
DU	M	52.363	57.600	62.836	68.072	73.308
DU	F	52.292	57.522	62.751	67.980	73.209
DU	C	52.439	57.683	62.927	68.171	73.415
New factors						
YO	M	52.694	57.963	63.232	68.502	73.771
YO	F	52.418	57.660	62.902	68.144	73.386
YO	C	52.516	57.768	63.019	68.271	73.522
LA	M	52.203	57.423	62.644	67.864	73.084
LA	F	52.105	57.316	62.526	67.737	72.947
LA	C	52.406	57.647	62.887	68.128	73.369
DU	M	52.598	57.858	63.118	68.378	73.638
DU	F	52.126	57.338	62.551	67.764	72.976
DU	C	52.474	57.721	62.969	68.216	73.464
Difference						
YO	M	0.031	0.034	0.037	0.040	0.043
YO	F	-0.159	-0.175	-0.191	-0.207	-0.223
YO	C	-0.231	-0.254	-0.278	-0.301	-0.324
LA	M	0.347	0.382	0.416	0.451	0.486
LA	F	0.282	0.310	0.338	0.367	0.395
LA	C	0.490	0.539	0.588	0.637	0.686
DU	M	0.235	0.259	0.282	0.306	0.329
DU	F	-0.166	-0.183	-0.200	-0.216	-0.233
DU	C	0.035	0.039	0.042	0.046	0.049

Examples of weight adjustment for Loin muscle depth

Probe weight (kg)		110				
Raw Lean depth (mm)		50	55	60	65	70
Current factors						
YO	M	47.593	52.353	57.112	61.872	66.631
YO	F	47.663	52.429	57.196	61.962	66.728
YO	C	47.525	52.277	57.030	61.782	66.535
LA	M	48.272	53.099	57.927	62.754	67.581
LA	F	48.301	53.131	57.961	62.791	67.621
LA	C	48.220	53.042	57.864	62.686	67.508
DU	M	47.841	52.625	57.409	62.193	66.977
DU	F	47.900	52.690	57.480	62.270	67.060
DU	C	47.778	52.556	57.333	62.111	66.889
New factors						
YO	M	47.568	52.325	57.082	61.839	66.596
YO	F	47.795	52.574	57.354	62.133	66.913
YO	C	47.714	52.486	57.257	62.028	66.800
LA	M	47.975	52.773	57.570	62.368	67.165
LA	F	48.058	52.864	57.670	62.476	67.282
LA	C	47.805	52.586	57.366	62.147	66.927
DU	M	47.646	52.411	57.175	61.940	66.705
DU	F	48.041	52.845	57.649	62.453	67.257
DU	C	47.749	52.524	57.298	62.073	66.848
Difference						
YO	M	-0.025	-0.028	-0.030	-0.033	-0.035
YO	F	0.132	0.145	0.158	0.171	0.185
YO	C	0.189	0.208	0.227	0.246	0.265
LA	M	-0.297	-0.327	-0.356	-0.386	-0.416
LA	F	-0.242	-0.267	-0.291	-0.315	-0.339
LA	C	-0.415	-0.456	-0.498	-0.539	-0.581
DU	M	-0.195	-0.214	-0.234	-0.253	-0.273
DU	F	0.141	0.155	0.169	0.183	0.197
DU	C	-0.029	-0.032	-0.035	-0.038	-0.041

Examples of weight adjustment for Loin muscle depth

Probe weight (kg)		125				
Raw Lean depth (mm)		50	55	60	65	70
Current factors						
YO	M	44.389	48.828	53.267	57.705	62.144
YO	F	44.541	48.995	53.449	57.903	62.357
YO	C	44.240	48.664	53.088	57.512	61.935
LA	M	45.893	50.483	55.072	59.661	64.251
LA	F	45.958	50.554	55.149	59.745	64.341
LA	C	45.776	50.353	54.931	59.508	64.086
DU	M	44.931	49.424	53.917	58.410	62.903
DU	F	45.062	49.568	54.074	58.580	63.086
DU	C	44.792	49.271	53.750	58.229	62.708
New factors						
YO	M	44.334	48.768	53.201	57.635	62.068
YO	F	44.829	49.312	53.795	58.278	62.761
YO	C	44.652	49.117	53.582	58.048	62.513
LA	M	45.228	49.751	54.274	58.797	63.319
LA	F	45.413	49.954	54.495	59.037	63.578
LA	C	44.852	49.337	53.822	58.307	62.792
DU	M	44.504	48.954	53.404	57.855	62.305
DU	F	45.374	49.911	54.448	58.986	63.523
DU	C	44.728	49.201	53.673	58.146	62.619
Difference						
YO	M	-0.054	-0.060	-0.065	-0.071	-0.076
YO	F	0.289	0.318	0.347	0.376	0.404
YO	C	0.412	0.454	0.495	0.536	0.577
LA	M	-0.665	-0.732	-0.798	-0.865	-0.931
LA	F	-0.545	-0.599	-0.654	-0.708	-0.763
LA	C	-0.924	-1.016	-1.109	-1.201	-1.293
DU	M	-0.427	-0.470	-0.512	-0.555	-0.598
DU	F	0.312	0.343	0.375	0.406	0.437
DU	C	-0.064	-0.070	-0.077	-0.083	-0.089