Supporting Information

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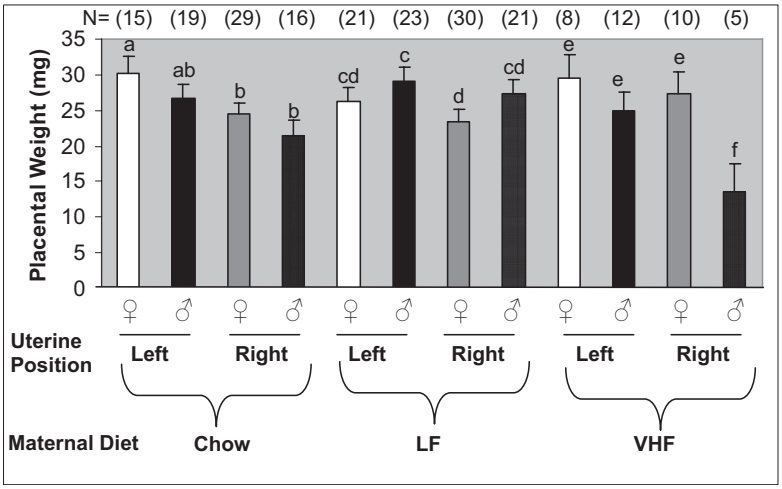

Fig. S1. Placental weights based on sex, uterine horn position (left vs. right), and maternal diet (C, LF, and VHF). As interactions exists, only comparisons within diet groups were made. Bar graphs within a diet group that have varying letters (a–f) differ at $P < 0.05$. The total number of fetuses within each group is displayed at the top. These were from 12 C dams, 14 LF dams, and 7 VHF dams.

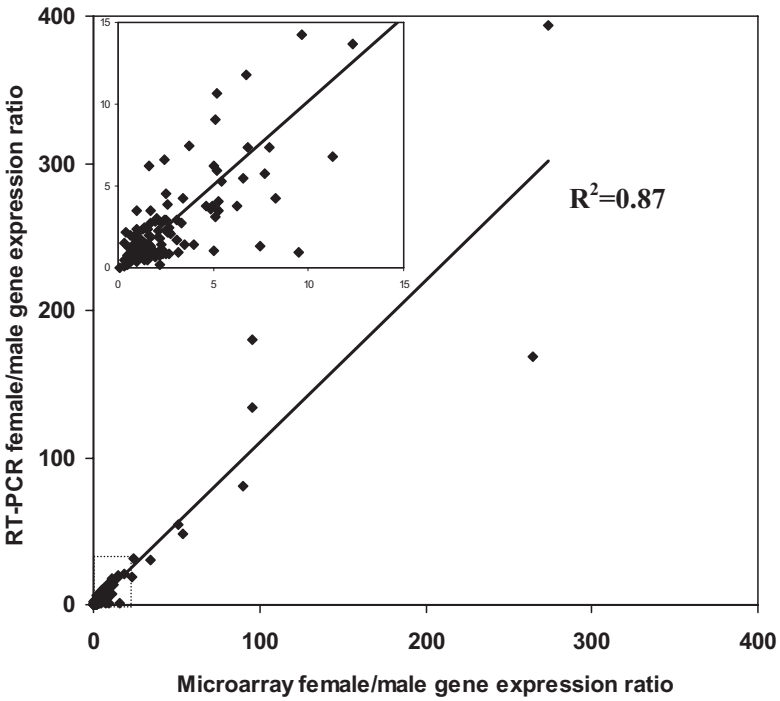

Fig. S2. A plot of the microarray versus RT-PCR values for the female-to-male gene expression ratio for 16 different genes to determine how closely these two procedures mirror each other. The quantitative RT-PCR and microarray data correlated quite well for the majority of the 160 samples, with an overall correlation coefficient of 0.87. The 16 genes analyzed included *Ceacam18*, *Esr1*, *Ets1*, *Fgf2*, *Hoxa11*, *Htr2b*, *Klk1*, *Olfr1381*, *Olfr154*, *Olfr433*, *Olfr520*, *Ren1*, *Ren2*, *Pcdhb18*, *Aqp9*, and *Ccr3*. (*Inset*) A more detailed view of the boxed region in the lower graph.

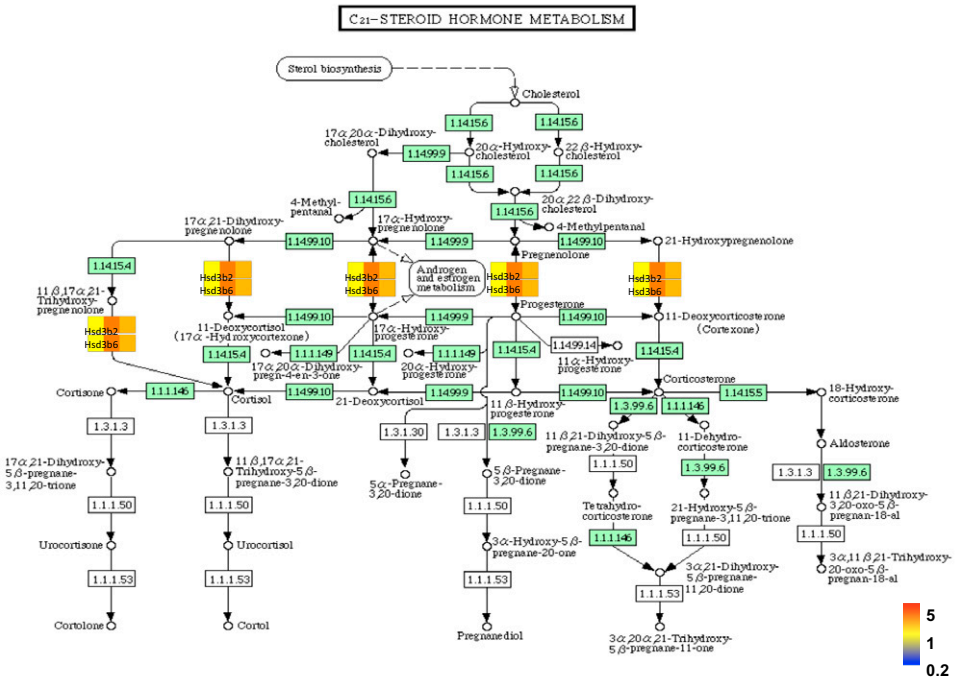

Fig. S3. Differentially expressed genes (>2-fold; $P < 0.05$ in two-sample *t* tests) in placentae of LF or VHF male versus C male placentae in the KEGG C21-steroid metabolism pathway. Genes were normalized to the mean intensity of four C male placentae samples. The three bars in each colored box represent the mean normalized expression for, from left to right, C males, LF males, and VHF males. None of the genes in this pathway were differentially expressed in diet comparisons in the female samples.

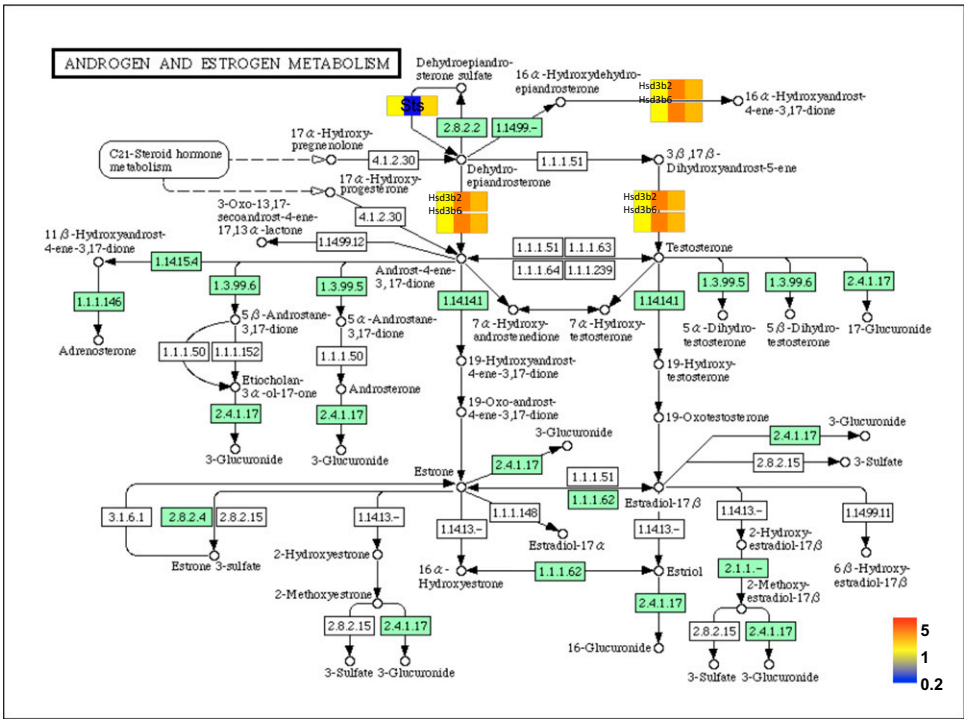

Fig. S4. Differentially expressed genes (>2-fold, $P < 0.05$) in LF male vs. C male in the KEGG androgen and estrogen metabolism pathway. Genes were normalized to the mean intensity of four C male placentae samples. The three bars in each colored box represent the mean normalized expression for, from left to right, C males, LF males, and VHF males.

Table S1. Variables affecting placental weight

Variable	*P* value
Maternal diet	0.38
Uterine position	**0.001**
Interaction between maternal diet and uterine position	0.38
Sex	**0.04**
Interaction between maternal diet and sex	**0.002**
Interaction between uterine position and sex	0.37
Interaction among maternal diet, uterine position, and sex	0.38

Table S2. Number of gene probes differentially regulated in male and female placentae (>2-fold; $P < 0.05$)

Genes	C	LF	VHF
Autosomal chromosomes	232	190	318
Up-regulated autosomal genes (males vs. females)	33	10	8
Down-regulated autosomal genes (males vs. females)	199	180	310
Sex chromosomes	20	9	26
Up-regulated sex chromosome genes (males vs. females)	9	3	10
Down-regulated sex chromosome genes (males vs. females)	11	6	16

Table S3. Male to female expression ratio for select autosomal genes in the C, LF, and VHF diet groups, as determined by microarray analysis

Gene name	Official symbol	Mouse GenBank accession no.	C		LF		VHF	
			M/F ratio	*P* value	M/F ratio	*P* value	M/F ratio	*P* value
Aquaporin 9	*Aqp9*	NM_022026	0.63	0.37	0.72	0.31	0.41	<0.01
Chemokine (C-C motif) receptor 3	*Ccr3*	NM_009914	0.75	0.682	2.17	0.55	0.29	0.01
CEA-related cell adhesion molecule 1	*Ceacam18*	NM_028236	0.12	0.07	0.21	0.09	0.30	0.374
Estrogen receptor-α	*Esr1*	NM_007956	0.21	0.05	1.33	0.49	0.39	0.24
E26 avian leukemia oncogene 1, 5′ domain	*Ets1*	NM_011808	0.63	<0.01	0.86	0.04	0.85	0.2
Fibroblast growth factor 2	*Fgf2*	NM_008006	0.31	0.13	0.52	0.09	0.41	<0.01
Homeo box A11	*Hoxa11*	NM_010450	0.31	0.04	0.49	0.14	0.34	0.14
5-hydroxytryptamine (serotonin) receptor 2B	*Htr2b*	NM_008311	0.41	0.02	0.37	0.08	0.31	0.14
Kallikrein 1	*Klk1*	NM_010639	0.60	0.09	0.38	0.05	1.10	0.75
Olfactory receptor 1381	*Olfr1381*	NM_146469	0.62	<0.01	0.56	0.15	0.68	0.06
Olfactory receptor 154	*Olfr154*	NM_013728	2.39	<0.01	1.66	0.16	1.10	0.78
Olfactory receptor 433	*Olfr433*	NM_146717	0.32	0.21	0.67	0.54	0.21	0.04
Olfactory receptor 520	*Olfr520*	NM_147063	0.51	0.23	0.97	0.94	0.29	0.01
Protocadherin beta 18	*Pcdhb18*	NM_053143	0.66	0.13	0.34	<0.01	0.43	0.05
Renin1	*Ren1*	NM_031192	0.12	0.07	0.34	0.06	0.14	0.21
Renin2	*Ren2*	NM_031193	0.19	0.14	0.22	0.1	0.17	0.17

Table S4. Male/female ratio for placental expression of prolactin and other endocrine-related genes, as determined by microarray analysis

PRL family gene name and other endocrine-related genes	Official symbol	Official alias symbol	Mouse GenBank accession no.	Male/female ratio		
				C	LF	VHF
Prolactin	*Prl*	*Prla1*	NM_011164	1.30	1.06	0.86
Prolactin family 2, subfamily a, member 1	*Prl2a1*	*PLP-M*	NM_019991	1.08	0.98	0.90
Prolactin family 2, subfamily b, member 1	*Prl2b1*	*PLP-K*	NM_025532	1.21	1.02	1.06
Prolactin family 2, subfamily c, member 3	*Prl2c3*	*PLF2*	NM_011118	1.13*	0.96	0.94
Prolactin family 2, subfamily c, member 5	*Prl2c5*	*MRP4*	NM_181852	1.13	1.08	1.02
Prolactin family 3, subfamily a, member 1	*Prl3a1*	*PLP-I*	NM_025896	0.92	0.95	1.03
Prolactin family 3, subfamily b, member 1	*Prl3b1*	*PL-II, Csh2*	NM_008865	1.15**	1.05	0.96
Prolactin family 3, subfamily c, member 1	*Prl3c1*	*PLP-J*	NM_013766	0.88	1.17	0.97
Prolactin family 3, subfamily d, member 1	*Prl3d1*	*PL-4α, Csh1α*	M35662	1.06	1.07	0.84
Prolactin family 3, subfamily d, member 2	*Prl3d2*	*PL-4β, Csh1β*	NM_172155	1.31**	1.14	0.87
Prolactin family 4, subfamily a, member 1	*Prl4a1*	*PLP-A*	NM_011165	1.19	1.01	0.96
Prolactin family 5, subfamily a, member 1	*Prl5a1*	*PLP-L*	NM_023746	1.30***	0.84	1.28**
Prolactin family 6, subfamily a, member 1	*Prl6a1*	*PLP_B*	NM_011166	1.09	1.32	1.15
Prolactin family 7, subfamily a, member 1	*Prl7a1*	*PLP-E*	NM_008930	1.19	1.38	0.95
Prolactin family 7, subfamily a, member 2	*Prl7a2*	*PLP-F*	NM_011168	0.90	1.23	1.13
Prolactin family 7, subfamily b, member 1	*Prl7b1*	*PLP-N*	NM_029355	1.03	1.13	1.08
Prolactin family 7, subfamily c, member 1	*Prl7c1*	*PLP-O*	NM_026206	1.22**	1.18**	1.26
Prolactin family 7, subfamily d, member 1	*Prl7d1*	*PLP-RP*	NM_011120	1.16	1.06	1.01
Prolactin family 8, subfamily a, member 1	*Prl8a1*	*PLP-Cδ*	AK014414	0.87	1.11	1.09
Prolactin family 8, subfamily a, member 6	*Prl8a6*	*PLP-Cα*	NM_011167	1.17	0.95	0.90
Prolactin family 8, subfamily a, member 8	*Prl8a8*	*PLP-Cγ*	NM_023741	1.07	1.17	1.44
Prolactin family 8, subfamily a, member 9	*Prl8a9*	*PLP-Cβ*	NM_023332	1.40	1.28	1.1
Growth hormone	*Gh*	*GH*	NM_008117	1.13	1.17	0.66**
Glycoprotein hormone, alpha subunit	*Cga*	*LHa*	NM_009889	1.17	1.48	1.10
Luteinizing hormone, beta subunit	*Lhb*	*LH*	NM_008497	1.01	1.55**	0.87**

*$P < 0.00005$; **$P < 0.05$; ***$P < 0.01$.

Other Supporting Information Files

Dataset S1 (XLS)
Dataset S2 (XLS)