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An insufficient glucose supply causes reduced lactose

*Institute of Dairy Science, MoE Key Laboratory of Molecular Animal Nutrition, College of Animal Sciences, Zhejiang University, Hangzhou 310058, P.R. China; †Beijing Key Laboratory for Dairy Cow Nutrition, College of Animal Science and Technology, Beijing University of Agriculture, Beijing 102206, P.R. China; and ‡Laboratory of Lactation and Metabolic Physiology, Department of Animal and Veterinary Sciences, University of Vermont, 211 Terrill Building, 570 Main Street, Burlington, VT 05505

investigate the nutrient availability for milk production [illegible] receptor, and phosphofructokinase-liver, phosphofructokinase-muscle, and phosphofructokinase-platelet [illegible] (CS), 30% rice straw (RS), or 23% alfalfa hay [illegible] in the AH group ($P < 0.05$). [illegible] 7% Chinese wildrye hay (AH) [illegible] AH-fed cows [illegible] CS-fed cows [illegible] 15% of DMI [illegible] 55% [illegible] RS-fed cows ($P = 0.02$). [illegible] RNA abundance of [illegible] DMI [illegible] RS-fed cows [illegible] AH or CS [illegible] 12- [illegible] ($P < 0.01$) [illegible] RS [illegible] AH group ($P = 0.03$) [illegible] AH and CS [illegible] of insulin to glucagon in the mammary venous plasma [illegible] RS [illegible] AH or CS [illegible] AH [illegible] CS groups ($P < 0.01$) [illegible] ($P = 0.04$). [illegible] RS [illegible] RNA [illegible] RS [illegible] AH to CS [illegible] ($P = 0.04$) [illegible]

Key words: cereal straw, forage, lactose synthesis, glucose, glucagon, gene expression

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Alfalfa hay (AH), as the dominant forage [illegible] in China [illegible] ply is largely dependent on its increased import from [illegible] (nt arsy 900 [illegible] 2014). Cereal straws, such as corn stover (CS) and [illegible] (RS), are produced abundantly all over the world (Pahns et al., 2008) and can be [illegible] 2014) [illegible] RS instead of AH. [illegible]

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[2]Corresponding author: [illegible]@zju.edu.cn
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[illegible] (Zhao, 2014). [illegible] (Scott et al., 1976). [illegible] mary gland is dependent on the arterial supply for [illegible] produced by fermentation in the rumen (Armstrong, 1965). [illegible] by changing the expression of key gluconeogenic enzymes, [illegible] mitochondrial phosphoenolpyruvate carboxykinase ([illegible]), and cytosolic phosphoenolpyruvate carboxykinase ([illegible]; Greenfield et al., 2010; Zhang et al., 2013). [illegible] up by facilitative glucose transporters ([illegible]) in the [illegible] (Zhao, 2014). [illegible] (Zhao, 2014). [illegible] (Mohammad et al., 2012) [illegible] -1,4- [illegible] α [illegible] (Faust et al., 2004). [illegible] substance in milk and accounts for approximately 50% of [illegible] 50% [illegible] and (Gál et al., 2004). [illegible] RS and CS [illegible] AH. [illegible] RS and [illegible] CS [illegible] AH.

Animals and Experimental Design

[illegible] Animal Care [illegible] (Hangzhou, China) [illegible] of the experimental design and animal treatments [illegible] (Wang et al., 2014). [illegible] (Table 1) [illegible] 55% [illegible] DM [illegible] 15% [illegible] DM [illegible] 3 [illegible] 1) 23% AH and 7% Chinese [illegible] dry hay, 2) 30% CS, [illegible] and 3) 30% RS. [illegible] (10 [illegible]

Table 1. [illegible] experimental diets based on alfalfa hay (AH), corn [illegible] (CS), [illegible] (RS) [illegible]

Item	AH	CS	RS
Dietary ingredient, % of DM			
Ground corn grain	27.0	27.0	27.0
Wheat bran	5.1	5.1	5.1
Soybean meal	12.7	12.7	12.7
Cottonseed meal	4.3	4.3	4.3
B[illegible]	1.0	0.0	0.0
Corn silage	15.0	15.0	15.0
AH	23.0	0.0	0.0
Chinese wild rye hay	7.0	0.0	0.0
CS	0.0	30.0	0.0
RS	0.0	0.0	30.0
Urea	0.0	1.0	1.0
Premix[1]	4.9	4.9	4.9
Nutrient composition, % of DM			
OM	92.0 ± 2.26	91.7 ± 1.69	90.6 ± 1.64
CP	16.7 ± 0.22	16.2 ± 0.29	16.0 ± 0.46
NDF	31.1 ± 1.73	36.3 ± 1.11	36.9 ± 1.26
ADF	18.9 ± 1.07	19.5 ± 2.21	21.9 ± 2.53
Nonfiber carbohydrate[2]	40.6 ± 3.29	36.0 ± 2.29	34.6 ± 3.66
Na^+	0.28	0.25	0.26
K^+	1.05	1.05	1.14
Cl^-	0.49	0.61	0.54
NE_L, Mcal/kg	1.57	1.45	1.43

[1] [illegible] (DM) [illegible] 1.25 [illegible] 25 [illegible] (Sigma [illegible] Inc., [illegible] MO), 21.44 [illegible] KCl, 41.25 [illegible] MgO, 150 [illegible] NaCl, 187.5 [illegible] NaHCO$_3$, 84 [illegible] Ca, 15 [illegible] P, 125,000 IU of vitamin A, 750,000 IU of vitamin D$_3$, 937.5 IU of vitamin E, 1,750 [illegible] Zn, 17.5 [illegible] Se, 28.75 [illegible] I, 375 [illegible] Fe, 15 [illegible] Co, 556.5 [illegible] Mn, and 343.75 [illegible] Cu.

[2] Nonfiber carbohydrate = 100 − % NDF − % CP − % ether extract − % ash.

[illegible] 30.0 kg [SD 3.53] [illegible] and 160 [illegible] [SD 27.8] [illegible] 3.4 [SD 1.57] [illegible] randomly allocated to 1 of the 3 dietary treatments and [illegible] 14 [illegible] 2 [illegible] 3 [illegible] 0630, 1400, and 2000 h. [illegible] 6 [illegible]

Sampling, Measurements, and Analyses

[illegible] (Wang [illegible] (Waikato [illegible] NZ Ltd., Waikato, Hamilton, N[illegible] (D & F Control Systems, [illegible] San Ramon, CA) [illegible] (1999) [illegible] (Flo-4000; Foss Electric A/S, Hillerød, [illegible]

(2006). 3,000 × g at 4°C for 15 min, and stored at −20°C

the ratio of glucose uptake to the lactose secreted in milk

-CN, β-CN, αs2-CN, α-LA, ... by ... HPLC ... (2016). (Agilent 1100; Agilent Technologies, Inc., Santa Clara, CA) ... (1998). ... IGF-I ... Na+, K+ ... (DSI-903B; ...) ... (1996) ... IGF-1 ... RIA ... (2005) ... (2002)

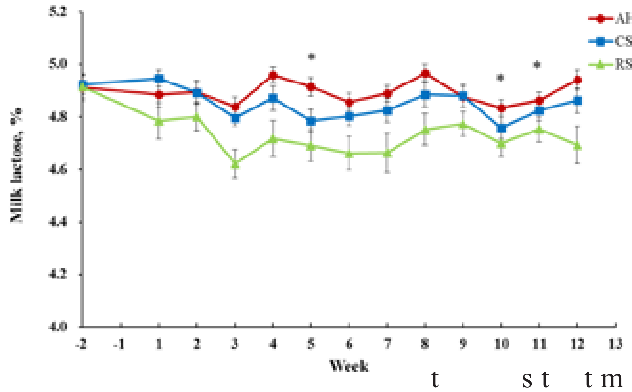
$$\text{CAD} = (Na^+ + K^+ - Cl^-).$$

Analysis of the mRNA Abundance

The samples of the liver and mammary tissues (n = 6 ...) ... (2010). ... (2012). ... 800 ... (Sartorius 300; ...) ... PBS (pH 7.2 to 7.4: NaCl 137 mM, KCl 2.7 mM, Na_2HPO_4 10 mM, and KH_2PO_4 2 mM). ... −20°C ... N_2 ... −80°C. ... 4°C ... N_2 ... RNA ... N and VFA ... 100 ... TRIZOL ... (Carlsbad, CA) ... cDNA ... VFA ... (2005) ... (GC-8A; ...) ... 6110A; ... Japan). ... PCR

The blood samples from the coccygeal arteries and ... 7500 ... Inc., ... CA) and ... 2x SYBR Premix Ex Taq (TaKaRa ... RR420A; TaKaRa). ... 0600, 1200, 1800, and 2400 ... 0900, 1500, 2100, ... 1 cycle at 95°C for 10 min, 40 cycles ... 95°C for 15 s, and 60°C for 34 s ... 0900 ... (60 to 95°C). ... G6Pase, PEPCK-m, PEPCK-c, IGF-1, IGF-1 receptor ... B4GALT, α-LA, GLUT1, GLUT3, GLUT8, ... ribosomal protein-encoding genes ( ), ... NJ) ... 3,000 × g ... 4°C ... −80°C ... sion of the article at ...

The primers for phosphofructokinase-liver ( ), phosphofructokinase-muscle ( ), phosphofructokinase-platelet ( ), and ... -6- ... dehydrogenase ( ) ...



[illegible] (AH) [illegible] (CS) [illegible] (RS) [illegible] ($P > 0.05$) [illegible] CS- [illegible] ($P < 0.05$) [illegible] AH [illegible] CS ($P > 0.05$) [illegible] AH [illegible] RS ($P < 0.05$).

[illegible] Table S2 [illegible] article at [illegible]

[illegible] (Livak and Schmittgen, 2001) [illegible] RPS9 [illegible] (Bionaz and Loor, 2007).

Calculations and Statistical Analysis

[illegible] (Hanigan et al., 1998) [illegible]

[illegible] MPF, × [illegible]

[illegible] MPF [illegible]

[illegible] MPF/ [illegible]

[illegible] concentration are expressed in millimolar concentration [illegible] MPF [illegible] PROC MIXED of SAS (SAS Inst. Inc., Cary, NC). A ran- [illegible]

changes in the arterial and venous glucose concentra- [illegible]

$$Y_{ijk} = \mu + B_i + T_j + TM_k + TTM_{jk} + E_{ijk},$$

[illegible] Y_{ijk} [illegible] an, B_i is the random effect of block i, T_j is the diet [illegible] TM_k [illegible] TTM_{jk} is the interaction [illegible] E_{ijk} [illegible] $P \le$ 0.05. [illegible] $0.05 < P \le 0.10$.

Milk Lactose Content and Rumen Fermentation Characteristics

The changes in the milk lactose content over the [illegible] 5 ($P = 0.10$), 10 ($P = 0.09$), and 11 ($P = 0.12$), [illegible] RS-fed and CS-fed [illegible] AH ($P = 0.03$), [illegible] AH and CS [illegible] (Table 2). [illegible] CS ($P < 0.01$). [illegible] VFA ($P = 0.05$) and ac [illegible] ($P = 0.04$) [illegible] AH [illegible] CS. [illegible]

Glucose Utilization in the Mammary Gland

The glucose concentrations in both the artery and [illegible] RS-fed [illegible] AH or CS, [illegible] AH- and CS-fed [illegible] (Fig. 2). [illegible] glucose concentrations, measured from the pooled blood [illegible] 24-h [illegible]

Table 3. Rumen fermentation characteristics of dairy cows fed 3 experimental diets: alfalfa hay (AH), corn stover (CS), or rice straw (RS) for 14 wk[1]

	Treatment				
Item	AH	CS	RS	SEM	*P*-value
pH	6.62	6.34	6.42	0.096	0.15
Ammonia N, mM	10.4[b]	13.1[a]	13.3[a]	0.69	0.02
Total VFA, mM	81.8[a]	66.5[b]	72.3[ab]	4.91	0.12
Acetate, mM	59.6[a]	45.6[b]	54.7[ab]	4.22	0.10
Propionate, mM	16.4[a]	15.0[ab]	13.0[b]	1.03	0.09
Butyrate, mM	5.82	5.85	4.62	0.60	0.28
Molar proportion, %					
Acetate	73.0[ab]	67.3[b]	75.9[a]	2.02	0.03
Propionate	19.9[ab]	23.2[a]	18.0[b]	1.39	0.06
Butyrate	7.07[ab]	9.52[a]	6.18[b]	1.02	0.10
Acetate:propionate ratio	3.65[ab]	3.14[b]	4.22[a]	0.24	0.02
Propionate:butyrate ratio	2.87	2.94	2.99	0.26	0.94

[a,b] Means within a row with different superscripts differ significantly ($P < 0.05$).

[1] Values are the means of ... 10.

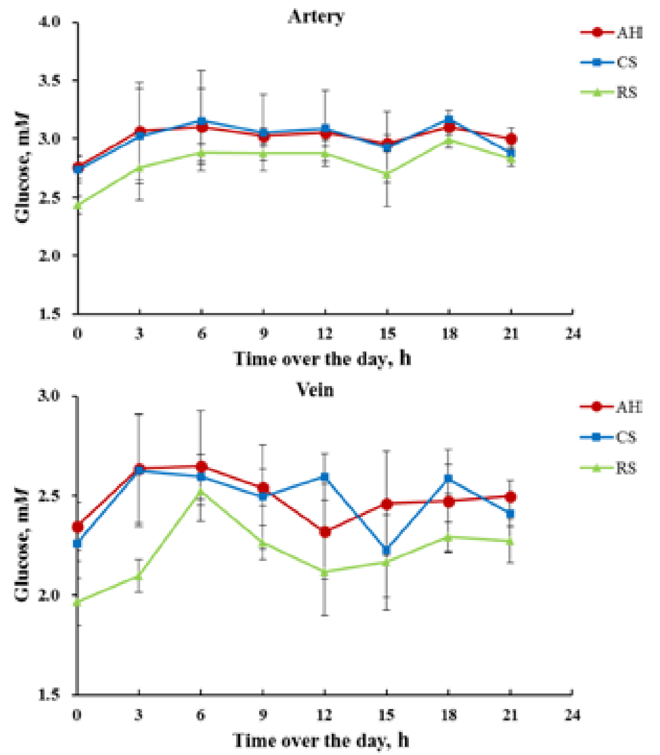


Figure ... Changes in glucose concentration ... cows fed alfalfa hay (AH), corn stover (CS), or rice straw (RS) ... over the day ... (n = 10).

... RS ... CS ($P = 0.03$) ... AH ... CS ... RS (Table 3). ... AH ... CS ($P < 0.01$) ... RS ($P < 0.01$). ... AH ... CS ($P < 0.01$) or RS ($P = 0.02$).

Blood Insulin, Glucagon, and IGF-1 Levels

... IGF-1 in the jugular vein, coccygeal artery, and mammary vein ... Table 4. ... in the glucagon concentrations in any of the blood ... ($P < 0.01$) ... AH ... CS ... RS, and in the mammary vein, the ratio of insulin to glucagon ($P = 0.05$) ... AH ... CS ... RS. ... IGF-1 ... ($P = 0.05$) ... AH ... CS ... RS ... AH ($P = 0.08$) or CS ($P = 0.09$) ... RS.

Gene Expression in the Liver and Mammary Gland

... PC mRNA ... AH ($P = 0.017$) or CS ($P = 0.038$) ... RS, ... AH- and CS- ... PEPCK- ($P = 0.05$), PFK-L ($P = 0.04$), PFK-M ($P = 0.03$), PFK-P ($P = 0.04$) and IGF-1R ($P = 0.04$) mRNA ... AH ... RS, ... CS ... AH ... IGF-1 mRNA ... CS- ... ($P = 0.07$) or RS- ... ($P = 0.08$) ... AH- ... G6Pase and PEPCK-... mRNA ... GLUT1, GLUT3, and GLUT8) and B4GALT mRNA ... similar in the mammary gland from each of the groups (Table 6). However, ... LA ... mRNA ... CS ... AH ($P = 0.08$).

Milk Protein Profiles and Milk Ions

... Table 7. ... κ-CN, β-CN, α-CN, and α-LA ... CS ... AH ($P < 0.01$) or RS ($P < 0.01$), and β-LG ... CS ... AH ($P < 0.01$) or RS ($P < 0.01$). ...

Average plasma glucose concentrations [illegible] 8 [illegible] 24- [illegible] (ry 3) [illegible] fed 3 experimental diets based on alfalfa hay (AH), corn [illegible] (CS), or rice straw (RS)

Glucose	Treatment AH	CS	RS	SEM	P-value
Arterial, mM	3.04	2.97	2.89	0.053	0.18
V[illegible], mM	2.48[a]	2.46[a]	2.25[b]	0.069	0.05
AV difference,[2] mM	0.55[ab]	0.51[b]	0.64[a]	0.044	0.13
U[illegible],[3] [illegible]/d	10.2[a]	5.58[b]	5.96[b]	0.870	<0.01
C[illegible] rate,[4] L/[illegible]	171.3[a]	95.9[b]	112.8[b]	15.71	0.01

[a,b] Means [illegible] significantly different (P < 0.05).

[1] [illegible] 10.

[2] AV = arterial − venous.

[3] U[illegible] = AV difference (mM) × [illegible] (L/d).

[4] C[illegible] rate = AV difference (mM) × [illegible] (L/d)/ venous concentration (mM) × 100.

The concentrations of insulin, glucagon, and IGF-1 [illegible] fed 3 diets based on alfalfa hay (AH), corn [illegible] (CS), or rice straw (RS)

I[illegible]	Treatment AH	CS	RS	SEM	P-value
J[illegible]					
In[illegible], μIU/L	15.0	16.0	12.5	1.30	0.18
G[illegible], [illegible]/L	82.1	82.6	81.5	3.39	0.97
IGF-1, n[illegible]/L	200.2	198.2	173.5	9.91	0.13
Mo[illegible] ratio	4.45	4.71	3.81	0.42	0.33
C[illegible]					
In[illegible], μIU/L	16.6	16.7	15.6	0.81	0.59
G[illegible], [illegible]/L	87.5	92.6	91.8	3.52	0.32
IGF-1, n[illegible]/L	211.7[a]	207.8[a]	181.1[b]	7.03	0.03
Mo[illegible] ratio	4.63	4.34	4.04	0.21	0.17
M[illegible]					
In[illegible], μIU/L	17.9[a]	14.5[b]	14.2[b]	0.81	<0.01
G[illegible], [illegible]/L	88.5	88.1	85.7	3.49	0.83
IGF-1, n[illegible]/L	194.6	174.1	196.8	10.54	0.28
Mo[illegible] ratio	4.95[a]	4.03[b]	4.04[b]	0.28	0.05

[a,b] Means [illegible] significantly different (P < 0.05).

[1] [illegible] 6.

[illegible] Na^{+} concentration [illegible] RS [illegible] CS (P = 0.01), and [illegible] K^{+} concentration [illegible] fed AH (P = 0.02) or CS (P = 0.05). [illegible] Na^{+} and K^{+} concentrations (Ps < 0.01) and CAD (P = 0.01) [illegible] fed AH or CS, [illegible] AH and CS. [illegible] Cl^{-} [illegible] 3 [illegible].

The milk lactose content is relatively constant [illegible] (1984) and [illegible] (1989) [illegible] 30% [illegible] RS [illegible] (2014) [illegible] 12 [illegible] genesis, hormone regulation, glucose transport, and [illegible].

Propionate in the Rumen

Propionate is produced by microorganism-mediated fermentation in the rumen and is the major substrate of gluconeogenesis in the liver in ruminants (Armstrong, 1965). A [illegible] (2003).

In [illegible] study, RS-fed [illegible] propionate supply in the liver for gluconeogenesis due [illegible].

Gluconeogenesis in the Liver

Glucose is [illegible] RS, [illegible] RS-fed [illegible] compared [illegible] AH- and CS-fed [illegible] (Table 3). [illegible] (1992). [illegible] G6Pase, PEPCK-c, [illegible] PEPCK-c, and PC [illegible] (Fig. 1). [illegible] mRNA [illegible] (2000) [illegible] PEPCK-c mRNA [illegible] (2000); [illegible] PC mRNA [illegible] (2005). In [illegible] PEPCK-c and PC mRNA [illegible] RS [illegible] fed AH, [illegible] RS-fed [illegible] RS [illegible] fed AH, [illegible].

T sRNA abt nllanch of n rum d o gluconeogenesis and glycolysis in the liver of dairy co [1] fed 3 diets based on alfalfa hay (AH), corn stover (CS), or rc ra (RS)

G n [2]	Treatment AH	CS	RS	SEMs	*P*-value
PC	17.2[a]	15.2[a]	6.73[b]	2.31	0.04
PEPCK-m	2.81[a]	2.38[ab]	1.61[b]	0.35	0.11
PEPCK-c	2.43	2.54	1.63	0.47	0.37
G6Pase	2.73	3.18	3.19	0.83	0.90
PFK-L	0.57[a]	0.34[ab]	0.17[b]	0.11	0.10
PFK-M	0.023[a]	0.014[ab]	0.010[b]	0.0031	0.06
PFK-P	0.081[a]	0.045[ab]	0.038[b]	0.0127	0.08
IGF-1	12.9	13.1	8.1	1.78	0.12
IGF-1R	31.9[a]	15.6[ab]	10.3[b]	6.39	0.09

[a,b] M an n mm r s p n s b p h nt e a c o l e n i e r c g e r a r u n i can y d fiffr n (*P* < 0.05).

[1] W n p b s r o f c o h r a i r o e 6. e h g u e

[2] *PC* = *pyruvate carboxylase*; *PEPCK-m* = *mitochondrial phosphoenolpyruvate carboxykinase*; *PEPCK-c* = *cytosolic phosphoenolpyruvate carboxykinase*; *G6Pase* = *glucose-6-phosphatase*; *PFK-L* = *phosphofructokinase-liver*; *PFK-M* = *phosphofructokinase-muscle*; *PFK-P* = *phosphofructokinase-platelet*; *IGF-1R* = *IGF-1 receptor*.

t p l s p v RNA s o f k o i o f c k o n a h (PFK), a c y s z l p t l i n y w n i y c o y a a y (Table 5) e s l h i

Hormonal Regulation

t t s l m v t S r a a f c o r l t i v b n i o e d g h d- l l c i v a s d m r p o i s s o n e g y a i x g r c n e i w t t n c o t s f d RS. N h r o n a l a f c e r, c a o propionate supply or negative energy balance, might l t k l a y a r l o (Drackley et al., 2001; Wang et al., 2014). O t r o r a n l i f c o i h n c e d i t d o n g m a f c- l f l o r. In n a w d l k c a w o n s a r u - g o u n g w r o p p l a r s i s s a c h t c l o g u o m l i. I n g s u p e l r g y t inhibits the transcription and activity of gluconeogen- i z p l s p r i y p n c t l d n o e s o v m p o t u y r e g a p p k c a r- boxykinase (l t), t s r a p p c t i v m o n a p h a l t k g u i g e o r a c o n i o n i (O'Brien and Granner, 1996). T i e l k t p t l t i IGF-1 a o i a i o i n n b o r o f PC and PEPCK ex- p i t i r s v i o n b t o n a l o c y (Wang et al., 2012). I n s d y, t v d o r h d l d u r a i h d a r r a IGF- t l c i o n c n t w a o n d a l t n d d o i n r a o c o h s f IGF-1 p e t l s v R N A s i v n w m r o f c o h f e d RS a y l b e i a r b d o i v t l s a m n r y i b h a n c g e h s t e c g o p l (Van t d a a r al., 1995; Wang et al., 2014). T e r c g n t i l v n m o f p IGF-1 and IGF-1R m RNA a w a e d t i c t a n l n l c o b c y t i h a g u r s r a h IGF-1 e c g n c l e m r a s t p w e c p p i t s t i o n, c l d t t w b r l a d i y u n d m m h a s p i t s i i t r t a r y l o r p i o f i t c r e a m p u k IGF-1 h r o- t l i l i n (R h a d c t f f a., 2003). In addition, m m m i c i n r a s o n n s t w a l i t a r y l n a c h a p s s a c o s l k w t c o i n t o r f i m m r r f l c s d b y e v a s a p b y r e c e t t b k e r y e i a h d

T e s RNA abundance of n r e a d o g s c d r a n d r t a n g h u i r i e o i i a o e n g u a u- a r y w a n d o f d a i r y c o [1] fed 3 diets based on alfalfa hay (AH), corn stover (CS), or rc ra (RS)

G n [2]	Treatment AH	CS	RS	SEM	*P*-value
GLUT1	0.099	0.080	0.091	0.0119	0.58
GLUT3	0.20	0.18	0.12	0.036	0.32
GLUT8	0.66	0.67	0.59	0.056	0.56
B4GALT	49.3	43.8	49.0	6.33	0.79
α-LA	58.1[a]	37.3[b]	51.9[ab]	6.73	0.19

[a,b] M a n n m m r s o p n s b p h n t e a c o l e n i e r c g e r n d i o b d f f r n (0.05 < *P* < 0.10).

[1] W n p b s r o f c o h r a i r o e 6. e h g u e

[2] *GLUT* = c o r a n c r t s; *B4GALT* = s -1,4- e a a β o y r a n f r a g; *α-LA* = *α-lactalbumin*.

l t i t n t n t c a s o n r a o b l u n g b y g n n u c a o n h u i l r a t o n v i m w a r t n o t a i r h y, i u g u c i e r j d c a e h h a better accuracy of mammary vein blood than arterial or jugular venous blood in determining the blood glucose status and its contribution ... K r o n t f e t a l. (1963) hypoglycemia is a more direct cause of decreasing milk ... tose might be mainly attributed the short supply of glucose, and the regulation of insulin and glucagon may be i v l r s f l c l o f t b o o d c o c i o n h a r a e g u e

Glucose Utilization in the Mammary Gland

C t o n i w n l s o i r a r t r a a h d c h e n o c s g t v i c h c n r a l e w a t a o e r MRF (Wang et al., 2014), e e s a k a w y e c o l h w a a 30% o u r n t c o h w f d RS w o i a r n d m e c o f d AH. O r h a k a r y u e s e s t o t a o p h a w g u r c o n i u n v i e a r e- ous study (Cant et al., 2002) ... u n a l e i o s f a r l o x e a t u y 7 i 2 e o / d r e q r d o h l o d c u t t n e f o f 14.4 / d, a m a o n a g r l f d CS to RS. T t o e r c i o n c h e r a c d n i o f a r r a e difference and uptake in the mammary gland of the RS-fed ... expression of the glucose transporters in the mammary ... GLUT1, GLUT3, GLUT8 mRNA ... n i c a n y i d f i f f r n g n ... t f d RS and AH ... (Zhao, 2014). ... GLUT ... GLUT1 and GLUT8 ... (Zhao, 2014). GLUT3 ... (2015).

Table 7. [illegible] fed 3 diets based on alfalfa hay (AH), corn stover (CS), or rice straw (RS)

Item[2]	AH	CS	RS	SEM	P-value
M[illegible], % [illegible]					
κ-CN	8.74	7.97	7.52	0.602	0.37
α_{s2}-CN	11.63	11.18	10.51	0.589	0.42
α_{s1}-CN	30.28	31.92	32.48	0.835	0.18
β-CN	34.3[a]	26.7[b]	35.4[a]	0.976	<0.01
α-LA	5.23[x]	4.35[y]	5.00[xy]	0.360	0.23
β-LG	9.82[b]	17.8[a]	9.07[b]	1.101	<0.01
M[illegible], *M*					
Na^+	18.5[ab]	17.5[b]	19.7[a]	0.58	0.04
K^+	44.3[b]	44.8[b]	47.2[a]	0.80	0.04
Cl^-	27.6	27.4	27.8	0.23	0.44
$Na^+ + K^+$	62.7[b]	63.4[ab]	66.9[a]	0.84	<0.01
CAD	35.2[b]	36.0[b]	39.1[a]	0.86	0.01

[a,b] Means [illegible] differ significantly ($P < 0.05$).

[x,y] Means [illegible] ($0.05 < P < 0.10$).

[1] [illegible] 10.

[2] CN = [illegible]; LA = [illegible]; LG = [illegible]; CAD = [illegible] ($[Na^+ + K^+ - Cl^-]$ *M*).

[illegible] GLUT [illegible] mRNA [illegible] by the different arterial glucose supply and uptake [illegible] GLUT [illegible] RNA [illegible] GLUT8 [illegible] GLUT3 [illegible] used for lactose synthesis, glycolysis, and the pentose [illegible] (2014) [illegible] 75% [illegible] (1980). [illegible] cose is the main precursor of lactose and that the oxidation and transfer of glucose into lactose accounted for 69 to 98% [illegible] (1974). [illegible] Many [illegible] glucose uptake and lactose synthesis in the mammary [illegible] (2002; [illegible] 2012). [illegible] AH-fed [illegible] thase activity might not play a role because mammary [illegible] B4GALT [illegible]

[illegible] (2004), and α-LA [illegible] RS and AH (Tables 6 and 7).

Milk Osmotic Pressure

Lac[illegible] 50% of [illegible] (2004). [illegible] (2014). [illegible] RS [illegible] AH. [illegible] good health as demonstrated by the normal and rela[illegible] DMI [illegible] (2014). [illegible] concentration does not appear to be a result of health [illegible] (2005) [illegible] Na^+, K^+, and Cl^- [illegible] Na^+, K^+ [illegible] RS-fed [illegible] K^+ concentrations (Table 7) [illegible] K^+ [illegible] $Na^+ + K^+ + Cl^-$ concentration [illegible] (1980). [illegible] Na^+ and [illegible] K^+ [illegible] Cl^- [illegible] (2013).

Differences between the Rice Straw– and Corn Stover–Fed Cows

[illegible] CS-fed [illegible] RS-fed [illegible] (2014), [illegible] the factors that caused the reduced milk production in [illegible] RS [illegible] CS- and [illegible] AH-fed [illegible] CS- and AH-[illegible]

[illegible] although the rumen propionate concentrations in the [illegible] observation may imply a more seriously limited dietary [illegible] tein synthesis is regulated by the nutrient supply, such as [illegible]

Conclusions

[illegible] nate production and liver gluconeogenesis resulted [illegible]

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