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(// : // :)

(TWW/EJ)

(TWW4/EJ) (TWW3/EJ) (TWW2/EJ) (TWW1/EJ)

. / ± / / ± / / ± / / ± /

TWW2/EJ TWW2/EJ TWW1/EJ / /
TWW4/EJ
TWW2/EJ) / (TWW4/EJ TWW3/EJ) /
TWW1/EJ (TWW4/EJ

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() FOXPRO

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(TWW2/EJ) (TWW1/EJ)

(

(TWW4/EJ) (TWW3/EJ)

() FOXPRO

()

(TWW4/EJ) (TWW1/EJ)

(REML)

:

()

()

() DFREML

(

± (kg)		
()		
(%)		
/	/ ± /	TWW1/EJ
/	/ ± /	TWW2/EJ
/	/ ± /	TWW3/EJ
/	/ ± /	TWW4/EJ

$$y = Xb + Za + e$$

$$y = Xb + Za + Ws + e$$

y :
 b
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 e
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 W Z X

/ / / / /
/ / / / /
/ /
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TWW3/EJ

(P < /)
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(.)

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/ / / /

/) ()
() (/

TWW2/EJ

(/)
(/) ()
(/) () / /
(/)
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(/)

Log L	$s^2(\text{SE})$	$h_a^2(\text{SE})$	σ_p^2	σ_e^2	σ_s^2	σ_a^2	
/	/ (/)	/ (%)	/	/	/	/	TWW1/EJ
/	/ (/)	% (/)	/	/	/	/	TWW2/EJ
/	/ (/)	% (/)	/	/	/	/	TWW3/EJ
/	/ (/)	/ (/)	/	/	/	/	TWW4/EJ
/	/ (/)	/ (/)	/	/	/	/	TWW4/EJ
h_a^2	σ_p^2	σ_e^2	SE		σ_s^2	s^2	σ_a^2

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 (/ /)
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h^2 (SE)	σ_p^2	σ_e^2	σ_a^2		
/ (/)	/	/	/		
/ (/)	/	/	/	TWW2/EJ	TWW1/EJ
/ (/)	/	/	/	TWW3/EJ	
/ (/)	/	/	/	TWW4/EJ	
/ (/)	/	/	/		
/ (/)	/	/	/	TWW1/EJ	TWW2/EJ
/ (/)	/	/	/	TWW2/EJ	
/ (/)	/	/	/	TWW3/EJ	
/ (/)	/	/	/		
/ (/)	/	/	/	TWW1/EJ	TWW3/EJ
/ (/)	/	/	/	TWW2/EJ	
/ (/)	/	/	/	TWW4/EJ	
/ (/)	/	/	/		
/ (/)	/	/	/	TWW1/EJ	TWW4/EJ
/ (/)	/	/	/	TWW2/EJ	
/ (/)	/	/	/	TWW3/EJ	

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TWW/EJ

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r_{p12}	r_{e12}	r_{a12}	σ_{p12}	σ_{e12}	σ_{a12}		
/	/	/	/	/	/	TWW2/EJ	
/	/	/	/	/	/	TWW3/EJ	TWW1/EJ
/	/	/	/	/	/	TWW4/EJ	
/	/	/	/	/	/	TWW3/EJ	
/	/	/	/	/	/	TWW4/EJ	TWW2/EJ
/	/	/	/	/	/	TWW4/EJ	TWW3/EJ
		r_{a12}	σ_{a12}	σ_{a12}			O_{a12}
						r_{p12}	r_{e12}

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