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 Conversion Factors For Production Traits. Source: INTERBULL 1912  
 Converted Canadian Proof = A + (B\* Foreign Proof)  
 Converted Proof Reliability = PCORR2\*Foreign Reliability

breed	country2	amilk	bmilk	afat	bfat	aprot	bprot	pcorr2
MSH	AUS	804.50	0.9920	57.800	1.3330	28.100	0.9110	0.6241
MSH	CAN	583.80	0.6410	38.200	0.7440	17.400	0.5070	0.7921
MSH	DEU	887.60	0.7020	68.300	0.9260	31.600	0.5900	0.7921
MSH	DFS	-2790.90	40.3570	-116.900	1.9300	-55.300	0.9840	0.7921
MSH	EST	881.20	0.8940	53.400	1.1300	29.700	0.7360	0.7921
MSH	GBR	305.90	1.4550	23.600	1.9760	11.700	1.3810	0.7921
MSH	IRL	1059.25	2.2596	56.935	2.6663	33.046	1.8357	0.6889
MSH	LTU	62.20	1.3470	24.700	1.3930	9.000	1.1900	0.7921
MSH	LVA	644.30	1.4410	48.000	1.7120	23.300	1.2660	0.7921
MSH	NLD	1581.95	0.5584	84.340	0.7507	47.589	0.4093	0.7921
MSH	NOR	-2272.00	34.1820	-106.600	1.6980	-49.100	0.8810	0.7921
MSH	NZL	555.80	1.3050	66.300	1.4820	28.100	1.1640	0.5929
MSH	USA	364.90	0.7120	22.700	0.9210	11.500	0.5870	0.8464
MSH	ZAF	448.40	0.6947	25.202	1.0452	12.960	0.6555	0.7921

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 Conversion Factors For SCS Traits. Source: INTERBULL 1912  
 Converted Canadian Proof = A + (B\* Foreign Proof)  
 Converted Proof Reliability = SCORR2\*Foreign Reliability

breed	country2	a	b	scorr2
MSH	AUS	100.500	-17.7460	0.8649
MSH	CAN	8.100	0.9460	0.8836
MSH	DEU	63.600	0.3850	0.8836
MSH	DFS	63.400	0.4100	0.8836
MSH	EST	58.000	0.4390	0.8836
MSH	GBR	102.000	-0.4670	0.8836
MSH	LTU	99.700	-14.7700	0.8649
MSH	LVA	99.300	-12.0680	0.8649
MSH	NLD	-36.161	1.3713	0.8836
MSH	NOR	65.700	0.3720	0.8649
MSH	NZL	97.400	-12.8870	0.8281
MSH	USA	168.800	-22.3500	0.8100
MSH	ZAF	102.785	-0.2097	0.8649

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 Conversion Factors For Type. Source = INTERBULL MACE 1912  
 Converted Canadian Proof = A + (B\* Foreign Proof)  
 Converted Proof Reliability = TCORR2\*Foreign Reliability

country2=AUS

c c f  
 a o o  
 n u r a b t

b	t	n	t	v	v	c
r	r	t	r	a	a	o
e	a	r	a	l	l	r
e	i	y	i	u	u	r
d	t	2	t	e	e	2

MSH	CONFORMATION	AUS	CONFORMATION	4.124	6.7543	0.5
MSH	FET AND LEGS	AUS	OVERALL FEET & LEG	-53.835	0.5551	
MSH	MAMMARY SYSTEM	AUS	OVERALL UDDER SCORE	5.100	6.9306	
MSH	STATURE	AUS	STATURE	-0.033	8.3173	
MSH	CHEST WIDTH	AUS	CHEST WIDTH	4.187	13.3491	
MSH	BODY DEPTH	AUS	BODY DEPTH	1.762	9.2630	
MSH	PIN WIDTH	AUS	RUMP WIDTH	2.183	14.3563	
MSH	RUMP ANGLE	AUS	RUMP ANGLE	-1.653	12.2368	
MSH	FOOT ANGLE	AUS	FOOT ANGLE	1.285	19.9512	
MSH	REAR LEGS SIDE VIEW	AUS	REAR LEG SET	1.202	20.6117	
MSH	REAR LEG REAR VIEW	AUS	REAR LEG REAR VIEW	2.515	18.1490	
MSH	UDDER DEPTH	AUS	UDDER DEPTH	0.129	8.9309	
MSH	MEDIAN SUSPENSORY	AUS	MEDIAN SUSPENSORY	0.652	11.3114	
MSH	FORE ATTACHMENT	AUS	FORE UDDER	4.197	12.0300	
MSH	TEAT PLACEMENT	AUS	FRONT TEAT PLACEMENT	2.389	11.1883	
MSH	TEAT LENGTH	AUS	TEAT LENGTH	0.192	14.9988	
MSH	REAR ATTACHMENT HEIGHT	AUS	REAR UDDER HEIGHT	0.511	9.8214	
MSH	REAR TEAT PLACEMENT	AUS	REAR TEAT PLACEMENT	0.102	14.5514	
MSH	ANGULARITY	AUS	ANGULARITY	2.836	11.2168	

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 Conversion Factors For Type. Source = INTERBULL MACE 1912  
 Converted Canadian Proof = A + (B\* Foreign Proof)  
 Converted Proof Reliability = TCORR2\*Foreign Reliability

country2=CAN

b	c	c	f			
r	a	o	o	a	b	t
e	n	u	r	v	v	c
	t	n	t	a	a	o
	r	t	r	l	l	r
	a	r	a			

e d	i t	y 2	i t	u e	u e	r 2
MSH 4	CONFORMATION	CAN	CONFORMATION	7.003	0.7865	0.7
MSH	FEET AND LEGS	CAN	OVERALL FEET & LEG	6.092	0.8728	
MSH	MAMMARY SYSTEM	CAN	OVERALL UDDER SCORE	10.266	0.9503	
MSH	STATURE	CAN	STATURE	4.376	0.8042	
MSH	CHEST WIDTH	CAN	CHEST WIDTH	1.369	0.7794	
MSH	BODY DEPTH	CAN	BODY DEPTH	1.644	0.6559	
MSH	PIN WIDTH	CAN	RUMP WIDTH	5.236	0.9675	
MSH	RUMP ANGLE	CAN	RUMP ANGLE	-0.243	0.8792	
MSH	FOOT ANGLE	CAN	FOOT ANGLE	3.350	0.9508	
MSH	REAR LEGS SIDE VIEW	CAN	REAR LEG SET	-0.266	0.8306	
MSH	REAR LEG REAR VIEW	CAN	REAR LEG REAR VIEW	4.664	0.7585	
MSH	UDDER DEPTH	CAN	UDDER DEPTH	3.706	0.8255	
MSH	MEDIAN SUSPENSORY	CAN	MEDIAN SUSPENSORY	3.314	0.7293	
MSH	FORE ATTACHMENT	CAN	FORE UDDER	7.951	0.9351	
MSH	TEAT PLACEMENT	CAN	FRONT TEAT PLACEMENT	2.928	1.1104	
MSH	TEAT LENGTH	CAN	TEAT LENGTH	-1.477	1.3431	
MSH	REAR ATTACHMENT HEIGHT	CAN	REAR UDDER HEIGHT	7.627	0.9108	
MSH	REAR TEAT PLACEMENT	CAN	REAR TEAT PLACEMENT	2.449	0.9309	
MSH	ANGULARITY	CAN	ANGULARITY	6.831	0.7096	

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Conversion Factors For Type. Source = INTERBULL MACE 1912  
Converted Canadian Proof = A + (B\* Foreign Proof)  
Converted Proof Reliability = TCORR2\*Foreign Reliability

country2=DEU

b r e e d	c a n t r y 2	c o u n t r y 2	f o r e i g n c o u n t r y 2	a v e r a g e	b v e r a g e	t c o r r e c t i o n
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MSH	FEET AND LEGS	DEU	OVERALL FEET & LEG	-27.202	0.3471
MSH	MAMMARY SYSTEM	DEU	OVERALL UDDER SCORE	-28.855	0.3751
MSH	STATURE	DEU	STATURE	-33.201	0.3809
MSH	CHEST WIDTH	DEU	CHEST WIDTH	-43.080	0.4680
MSH	BODY DEPTH	DEU	BODY DEPTH	-40.273	0.4377
MSH	PIN WIDTH	DEU	RUMP WIDTH	-53.478	0.6000
MSH	RUMP ANGLE	DEU	RUMP ANGLE	-61.153	0.5749
MSH	FOOT ANGLE	DEU	FOOT ANGLE	-35.292	0.4237
MSH	REAR LEGS SIDE VIEW	DEU	REAR LEG SET	-62.778	0.5890
MSH	REAR LEG REAR VIEW	DEU	REAR LEG REAR VIEW	-42.925	0.4953
MSH	UDDER DEPTH	DEU	UDDER DEPTH	-34.680	0.3812
MSH	MEDIAN SUSPENSORY	DEU	MEDIAN SUSPENSORY	-34.051	0.3638
MSH	FORE ATTACHMENT	DEU	FORE UDDER	-42.541	0.4810
MSH	TEAT PLACEMENT	DEU	FRONT TEAT PLACEMENT	-44.840	0.4753
MSH	TEAT LENGTH	DEU	TEAT LENGTH	-53.729	0.4969
MSH	REAR ATTACHMENT HEIGHT	DEU	REAR UDDER HEIGHT	-32.372	0.3700
MSH	REAR TEAT PLACEMENT	DEU	REAR TEAT PLACEMENT	-40.719	0.4057
MSH	ANGULARITY	DEU	ANGULARITY	-34.891	0.4303

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Conversion Factors For Type. Source = INTERBULL MACE 1912  
Converted Canadian Proof = A + (B\* Foreign Proof)  
Converted Proof Reliability = TCORR2\*Foreign Reliability

country2=DFS

	c	c	f			
	a	o	o			
	n	u	r	a	b	t
b	t	n	t	v	v	c
r	r	t	r	a	a	o
e	a	r	a	l	l	r
e	i	y	i	u	u	r
d	t	2	t	e	e	2
MSH	CONFORMATION	DFS	CONFORMATION	-47.361	0.4991	0.7
4						
MSH	FEET AND LEGS	DFS	OVERALL FEET & LEG	-36.088	0.4082	
MSH	MAMMARY SYSTEM	DFS	OVERALL UDDER SCORE	-47.101	0.5489	

MSH	STATURE	DFS	STATURE	-56.080	0.5836
MSH	CHEST WIDTH	DFS	CHEST WIDTH	-42.447	0.4571
MSH	BODY DEPTH	DFS	BODY DEPTH	-36.012	0.3570
MSH	PIN WIDTH	DFS	RUMP WIDTH	-52.527	0.5628
MSH	RUMP ANGLE	DFS	RUMP ANGLE	-52.120	0.5204
MSH	FOOT ANGLE	DFS	FOOT ANGLE	-62.228	0.6606
MSH	REAR LEGS SIDE VIEW	DFS	REAR LEG SET	-56.037	0.5791
MSH	REAR LEG REAR VIEW	DFS	REAR LEG REAR VIEW	-42.860	0.4636
MSH	UDDER DEPTH	DFS	UDDER DEPTH	-38.672	0.4283
MSH	MEDIAN SUSPENSORY	DFS	MEDIAN SUSPENSORY	-34.393	0.3503
MSH	FORE ATTACHMENT	DFS	FORE UDDER	-40.181	0.4711
MSH	TEAT PLACEMENT	DFS	FRONT TEAT PLACEMENT	-47.948	0.5178
MSH	TEAT LENGTH	DFS	TEAT LENGTH	-67.250	0.6379
MSH	REAR ATTACHMENT HEIGHT	DFS	REAR UDDER HEIGHT	-45.482	0.4799
MSH	REAR TEAT PLACEMENT	DFS	REAR TEAT PLACEMENT	-44.625	0.4512
MSH	ANGULARITY	DFS	ANGULARITY	-55.280	0.5795

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Conversion Factors For Type. Source = INTERBULL MACE 1912  
Converted Canadian Proof = A + (B\* Foreign Proof)  
Converted Proof Reliability = TCORR2\*Foreign Reliability

country2=GBR

	c	c	f			
	a	o	o			
	n	u	r	a	b	t
b	t	n	t	v	v	c
r	r	t	r	a	a	o
e	a	r	a	l	l	r
e	i	y	i	u	u	r
d	t	2	t	e	e	2
MSH	FEET AND LEGS	GBR	OVERALL FEET & LEG	4.068	3.5785	
MSH	MAMMARY SYSTEM	GBR	OVERALL UDDER SCORE	9.558	4.1690	
MSH	STATURE	GBR	STATURE	2.142	4.4115	
MSH	CHEST WIDTH	GBR	CHEST WIDTH	5.796	3.7784	

MSH	BODY DEPTH	GBR	BODY DEPTH	3.816	3.0487
MSH	PIN WIDTH	GBR	RUMP WIDTH	4.171	4.7347
MSH	RUMP ANGLE	GBR	RUMP ANGLE	-2.426	3.4606
MSH	FOOT ANGLE	GBR	FOOT ANGLE	1.410	3.8688
MSH	REAR LEGS SIDE VIEW	GBR	REAR LEG SET	-1.414	3.5478
MSH	UDDER DEPTH	GBR	UDDER DEPTH	3.359	2.5099
MSH	MEDIAN SUSPENSORY	GBR	MEDIAN SUSPENSORY	2.796	2.4886
MSH	FORE ATTACHMENT	GBR	FORE UDDER	8.664	3.3966
MSH	TEAT PLACEMENT	GBR	FRONT TEAT PLACEMENT	5.610	4.0597
MSH	TEAT LENGTH	GBR	TEAT LENGTH	-2.462	4.8522
MSH	REAR ATTACHMENT HEIGHT	GBR	REAR UDDER HEIGHT	5.407	4.0273
MSH	ANGULARITY	GBR	ANGULARITY	3.520	4.5945

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Conversion Factors For Type. Source = INTERBULL MACE 1912  
Converted Canadian Proof = A + (B\* Foreign Proof)  
Converted Proof Reliability = TCORR2\*Foreign Reliability

country2=NLD

	c	c	f			
	a	o	o		a	b
	n	u	r		v	v
b	t	n	t		a	a
r	r	t	r		l	l
e	a	r	a		u	u
e	i	y	i		e	e
d	t	2	t			2
MSH	CONFORMATION	NLD	CONFORMATION	-144.510	1.6139	0.7
4						
MSH	FEET AND LEGS	NLD	OVERALL FEET & LEG	-66.709	0.7342	
MSH	MAMMARY SYSTEM	NLD	OVERALL UDDER SCORE	-123.058	1.4058	
MSH	STATURE	NLD	STATURE	-91.170	1.0468	
MSH	CHEST WIDTH	NLD	CHEST WIDTH	-111.654	1.2174	
MSH	BODY DEPTH	NLD	BODY DEPTH	-85.835	0.9708	
MSH	PIN WIDTH	NLD	RUMP WIDTH	-89.058	1.0061	
MSH	RUMP ANGLE	NLD	RUMP ANGLE	-91.011	0.8989	
MSH	FOOT ANGLE	NLD	FOOT ANGLE	-118.924	1.2808	

MSH	REAR LEGS SIDE VIEW	NLD	REAR LEG SET	-108.176	1.0383
MSH	REAR LEG REAR VIEW	NLD	REAR LEG REAR VIEW	-86.558	0.9173
MSH	UDDER DEPTH	NLD	UDDER DEPTH	-92.307	0.9984
MSH	MEDIAN SUSPENSORY	NLD	MEDIAN SUSPENSORY	-88.651	0.9407
MSH	FORE ATTACHMENT	NLD	FORE UDDER	-115.386	1.2679
MSH	TEAT PLACEMENT	NLD	FRONT TEAT PLACEMENT	-138.940	1.4728
MSH	TEAT LENGTH	NLD	TEAT LENGTH	-123.548	1.2399
MSH	REAR ATTACHMENT HEIGHT	NLD	REAR UDDER HEIGHT	-93.227	1.0788
MSH	REAR TEAT PLACEMENT	NLD	REAR TEAT PLACEMENT	-105.679	1.1088
MSH	ANGULARITY	NLD	ANGULARITY	-95.224	1.1346

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Conversion Factors For Type. Source = INTERBULL MACE 1912  
Converted Canadian Proof = A + (B\* Foreign Proof)  
Converted Proof Reliability = TCORR2\*Foreign Reliability

country2=NOR

	c	c	f			
	a	o	o			
	n	u	r	a	b	t
b	t	n	t	v	v	c
r	r	t	r	a	a	o
e	a	r	a	l	l	r
e	i	y	i	u	u	r
d	t	2	t	e	e	2
MSH	CONFORMATION	NOR	CONFORMATION	-41.788	0.4332	0.7
4						
MSH	FEET AND LEGS	NOR	OVERALL FEET & LEG	-32.900	0.3389	
MSH	MAMMARY SYSTEM	NOR	OVERALL UDDER SCORE	-49.447	0.5038	
MSH	STATURE	NOR	STATURE	-40.679	0.3811	
MSH	CHEST WIDTH	NOR	CHEST WIDTH	-30.873	0.3782	
MSH	BODY DEPTH	NOR	BODY DEPTH	-27.720	0.2774	
MSH	PIN WIDTH	NOR	RUMP WIDTH	-36.198	0.4222	
MSH	RUMP ANGLE	NOR	RUMP ANGLE	-41.412	0.4247	
MSH	FOOT ANGLE	NOR	FOOT ANGLE	-37.514	0.3998	
MSH	REAR LEGS SIDE VIEW	NOR	REAR LEG SET	-37.369	0.3907	

MSH	REAR LEG REAR VIEW	NOR	REAR LEG REAR VIEW	-31.424	0.3319
MSH	UDDER DEPTH	NOR	UDDER DEPTH	-38.262	0.3702
MSH	MEDIAN SUSPENSORY	NOR	MEDIAN SUSPENSORY	-35.422	0.3334
MSH	FORE ATTACHMENT	NOR	FORE UDDER	-40.649	0.4314
MSH	TEAT PLACEMENT	NOR	FRONT TEAT PLACEMENT	-51.878	0.5096
MSH	TEAT LENGTH	NOR	TEAT LENGTH	-55.816	0.5259
MSH	REAR ATTACHMENT HEIGHT	NOR	REAR UDDER HEIGHT	-40.983	0.3796
MSH	REAR TEAT PLACEMENT	NOR	REAR TEAT PLACEMENT	-38.209	0.3911

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Conversion Factors For Type. Source = INTERBULL MACE 1912  
Converted Canadian Proof = A + (B\* Foreign Proof)  
Converted Proof Reliability = TCORR2\*Foreign Reliability

country2=NZL

	c	c	f			
	a	o	o			
	n	u	r	a	b	t
b	t	n	t	v	v	c
r	r	t	r	a	a	o
e	a	r	a	l	l	r
e	i	y	i	u	u	r
d	t	2	t	e	e	2
MSH	CONFORMATION	NZL	CONFORMATION	1.322	18.5239	0.6
2						
MSH	MAMMARY SYSTEM	NZL	OVERALL UDDER SCORE	-0.114	13.9980	
MSH	STATURE	NZL	STATURE	-6.582	10.1937	
MSH	CHEST WIDTH	NZL	CHEST WIDTH	4.327	16.1924	
MSH	BODY DEPTH	NZL	BODY DEPTH	1.402	11.8337	
MSH	PIN WIDTH	NZL	RUMP WIDTH	-0.461	18.7362	
MSH	RUMP ANGLE	NZL	RUMP ANGLE	-5.417	17.9635	
MSH	REAR LEGS SIDE VIEW	NZL	REAR LEG SET	2.256	42.4808	
MSH	MEDIAN SUSPENSORY	NZL	MEDIAN SUSPENSORY	-0.809	14.1616	
MSH	FORE ATTACHMENT	NZL	FORE UDDER	0.203	17.1145	
MSH	TEAT PLACEMENT	NZL	FRONT TEAT PLACEMENT	-2.244	23.1077	
MSH	REAR ATTACHMENT HEIGHT	NZL	REAR UDDER HEIGHT	0.938	16.1119	
MSH	REAR TEAT PLACEMENT	NZL	REAR TEAT PLACEMENT	-3.119	16.9858	

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 Conversion Factors For Type. Source = INTERBULL MACE 1912  
 Converted Canadian Proof = A + (B\* Foreign Proof)  
 Converted Proof Reliability = TCORR2\*Foreign Reliability

country2=USA

	c	c	f			
	a	o	o		a	b
b	n	u	r		v	v
r	r	t	t		a	a
e	a	r	a		l	l
e	i	y	i		u	u
d	t	2	t		e	e
						2
MSH	CONFORMATION	USA	CONFORMATION	5.281	6.5676	0.7
6						
MSH	FEET AND LEGS	USA	OVERALL FEET & LEG	4.677	4.4958	
MSH	MAMMARY SYSTEM	USA	OVERALL UDDER SCORE	8.755	5.9181	
MSH	STATURE	USA	STATURE	2.617	2.3829	
MSH	CHEST WIDTH	USA	CHEST WIDTH	2.030	5.0007	
MSH	BODY DEPTH	USA	BODY DEPTH	2.202	3.9556	
MSH	PIN WIDTH	USA	RUMP WIDTH	3.837	4.9846	
MSH	RUMP ANGLE	USA	RUMP ANGLE	-1.170	5.0117	
MSH	FOOT ANGLE	USA	FOOT ANGLE	1.732	6.5547	
MSH	REAR LEGS SIDE VIEW	USA	REAR LEG SET	-1.302	7.1587	
MSH	REAR LEG REAR VIEW	USA	REAR LEG REAR VIEW	3.163	-6.8356	
MSH	UDDER DEPTH	USA	UDDER DEPTH	3.358	4.2438	
MSH	MEDIAN SUSPENSORY	USA	MEDIAN SUSPENSORY	0.702	4.4817	
MSH	FORE ATTACHMENT	USA	FORE UDDER	6.717	4.7673	
MSH	TEAT PLACEMENT	USA	FRONT TEAT PLACEMENT	3.059	5.1981	
MSH	TEAT LENGTH	USA	TEAT LENGTH	-2.081	5.7885	
MSH	REAR ATTACHMENT HEIGHT	USA	REAR UDDER HEIGHT	6.441	4.3164	
MSH	REAR TEAT PLACEMENT	USA	REAR TEAT PLACEMENT	2.086	4.9895	
MSH	ANGULARITY	USA	ANGULARITY	6.526	5.3290	

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CALCULATION OF FAT% AND PROTEIN% FOR DECEMBER 2019

BREED	BMILK	BFAT	BPRT
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AYS	7815	325	264
BSW	8623	365	304
CN	6050	262	214
GUE	6678	309	230
JER	6768	345	260
HOL	10402	408	336
MS	6633	264	221

$$EBVFAT\% = 200 * [ (BFAT+EBVFAT*0.5) / (BMILK+EBVMILK*0.5) - (BFAT/BMILK) ]$$

$$EBVPROT\% = 200 * [ (BPRT+EBVPRT*0.5) / (BMILK+EBVMILK*0.5) - (BPRT/BMILK) ]$$

EXAMPLE:

A HOLSTEIN bull has EBV MILK=+1000, EBVFAT=+50, EBVPROT=+40

$$\begin{aligned} EBVFAT\% &= 200 * [ (408+50*0.5) / (10402+1000*0.5) - (408/ 1E4) ] \\ &= 200 * [ (408+25) / (10402+500) - (0.03922) ] \\ &= 200 * [ 0.03972 - 0.03922 ] \\ &= 200 * 0.00049 \\ &= 0.10 \end{aligned}$$

$$\begin{aligned} EBVPROT\% &= 200 * [ (336+40*0.5) / (10402+1000*0.5) - (336/ 1E4) ] \\ &= 200 * [ (336+20) / (10402+500) - (0.03230) ] \\ &= 200 * [ 0.03265 - 0.03230 ] \\ &= 200 * 0.00035 \\ &= 0.07 \end{aligned}$$