

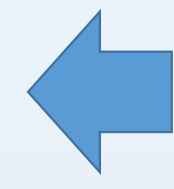
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Introduction & Objective

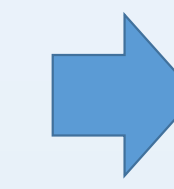
Indicator of ANIMAL HEALTH and WELFARE
 ECONOMIC consequences to farmers



UNASSISTED DEATH & EUTHANASIA



AIMS



Describe beef cattle mortality in Estonia
 Identify causes of death and euthanasia
 Identify animal cohorts with high/low risk

Materials & Methods

RISK FACTORS

Estonian Agricultural Registers and Information Board
 78,605 animals from 1,321 herds

id	date_birth	gender	breed	date_exit	event	loomad_arv	loomapidaja_id	date_ext	age_ext_days	reason_ext
EE0001982657	20.02.2001	0	2	18.03.2013	0	129	111	18.03.2013	145.06579	36
EE0002172828	29.12.2000	0	2	24.07.2013	0	24	5815	24.07.2013	151.01974	41
EE0002217345	30.01.2001	0	2	21.03.2013	1	88	503	21.03.2013	145.85526	39
EE0002423401	7.05.2001	0	15	22.02.2013	0	143	4756	22.02.2013	141.77632	30
EE0002680941	23.05.2001	0	15	12.09.2013	1	109	91923	12.09.2013	147.89474	22
EE0002808789	3.01.2002	0	16	4.05.2013	0	69	89522	4.05.2013	136.18421	44
EE0002808833	4.01.2002	0	16	29.08.2013	1	69	89522	29.08.2013	140	26
EE0002852928	27.06.2001	0	2	11.01.2013	0	69	97124	11.01.2013	138.71711	44
EE0002936376	1.11.2001	0	13	2.02.2013	0	129	1713	2.02.2013	135.26316	41
EE0003091821	16.03.2003	0	2	19.02.2013	0	45	53731	19.02.2013	119.375	44
EE0003157916	1.05.2002	0	13	29.08.2013	0	36	48096	29.08.2013	136.15132	26

CAUSES

Estonian Livestock Performance Recording Ltd
 Causes identified for 230 cows, 501 heifers, 473 steers

Results

Main causes of death and euthanasia

COWS

1. Other/unknown reasons (29.1%)
2. Trauma and accident (28.1%)
3. Metabolic & digestive disorders (20.3%)



HEIFERS

1. Trauma and accident (30.3%)
2. Metabolic & digestive disorders (28.3%)
3. Other/unknown reasons (25.0%)

STEERS

1. Metabolic & digestive disorders (30.2%)
2. Trauma and accident (28.8%)
3. Other/unknown reasons (20.3%)

Table 3. Risk factors for on-farm beef cattle (over 18 months) mortality including euthanasia in Weibull proportional hazard random effect model evaluated in 49,950 cattle from 1,214 herds

Variable	Category	n ^{ab} (%)	HR	95% CI	P-value	Wald testi P-value
Age category ^b	18-24 months	28,469 (37.05)	1			0.019
	24-36 months	21,624 (28.14)	1.20	0.97; 1.47	0.088	
	>36 months	26,755 (34.82)	1.30	1.08; 1.57	0.005	
Breed ^a	Aberdeen Angus	11,189 (22.37)	1			0.004
	Charolais	3,298 (6.59)	0.77	0.53; 1.11	0.166	
	Scottish Highland	3,520 (7.04)	0.70	0.49; 1.00	0.048	
	Hereford	12,955 (25.90)	0.94	0.75; 1.16	0.544	
	Limousin	10,002 (19.99)	0.95	0.77; 1.19	0.681	
	Simmental	4,141 (8.28)	1.24	0.91; 1.69	0.173	
Other ^b	4,923 (9.84)	1.31	1.04; 1.65	0.023		
Gender ^a	Female	38,267 (76.49)	1			<0.001
	Male	11,761 (23.51)	0.65	0.52; 0.83		
Herd size (number of animals) ^a	≥50	9,594 (19.18)	1			0.001
	25-50	11,074 (22.14)	0.84	0.66; 1.08	0.171	
	10-25	13,785 (27.55)	0.69	0.54; 0.89	0.004	
	<10	15,575 (31.13)	0.60	0.46; 0.78	<0.001	
Region ^a	Northeast	8,891 (17.80)	1			0.013
	Southeast	7,582 (15.18)	0.74	0.51; 1.07	0.108	
	Southwest	15,717 (31.47)	1.14	0.85; 1.54	0.376	
	Northwest	17,760 (35.56)	1.24	0.92; 1.67	0.149	

^aNumber of animals in each category

^bNumber of observations in each category after splitting the observations according to age categories

Mortality (on-farm death and euthanasia) rate estimates in female and male cattle by age group in 2013 and 2014

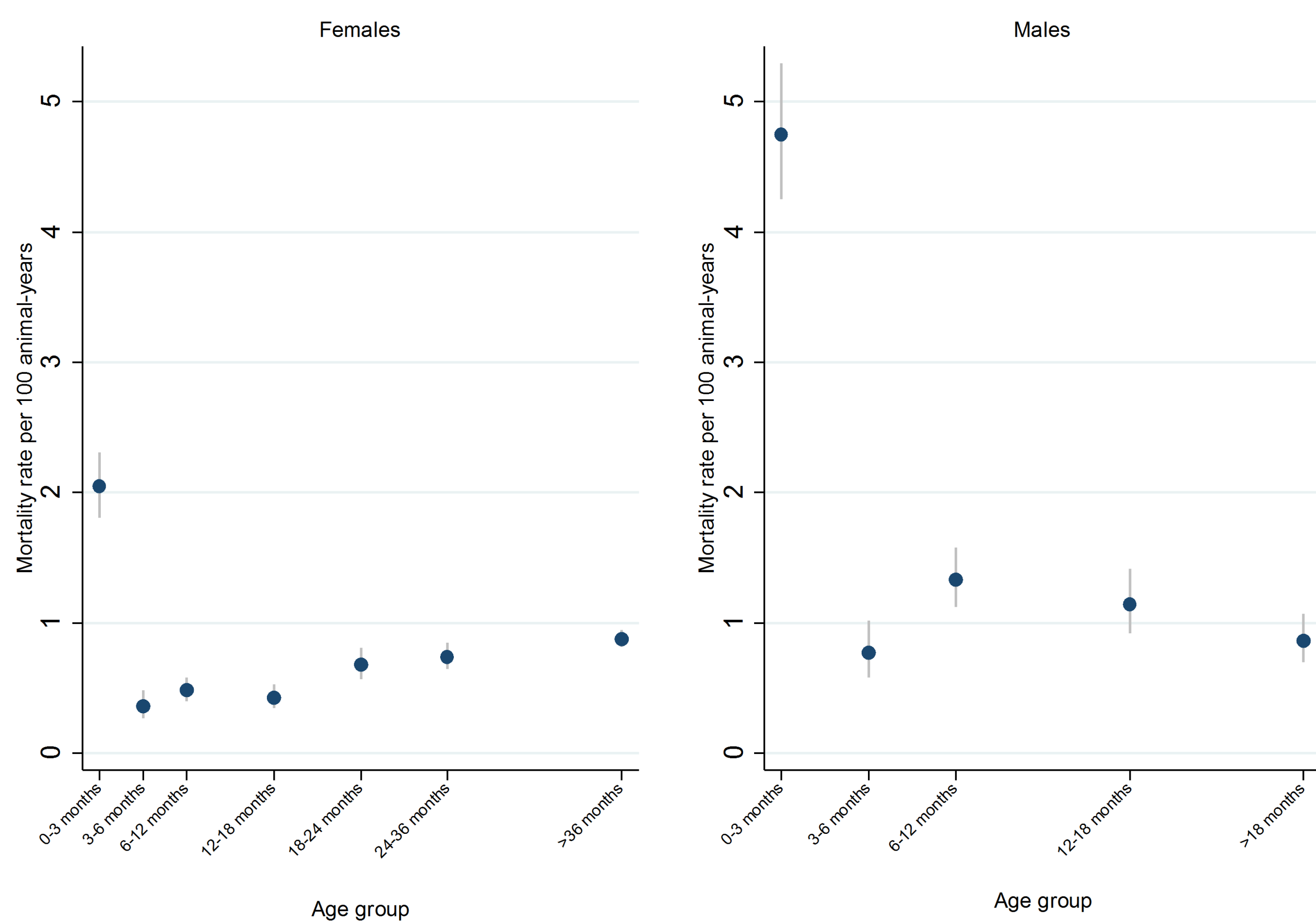


Table 1. Risk factors for on-farm beef calf (less than 3 months) mortality including euthanasia in Weibull proportional hazard random effect model evaluated in 35,145 calves from 1,152 herds

Variable	Category	n (%)	HR	95% CI	P-value	Wald testi P-value
Gender	Female	17,587 (50.03)	1			0.005
	Male	17,563 (49.97)	1.27	1.08; 1.50		
Herd size (number of animals)	≥50	11,726 (33.36)	1			0.014
	25-50	9,247 (26.31)	0.85	0.62; 1.16	0.294	
	10-25	7,594 (21.60)	0.55	0.38; 0.79	0.001	
	<10	6,583 (18.73)	0.77	0.56; 1.06	0.108	
Region	Northeast	6,908 (19.66)	1			0.023
	Southeast	5,905 (16.80)	0.44	0.24; 0.78	0.005	
	Southwest	10,744 (30.57)	0.64	0.40; 1.03	0.065	
	Northwest	11,588 (32.97)	0.54	0.34; 0.87	0.011	

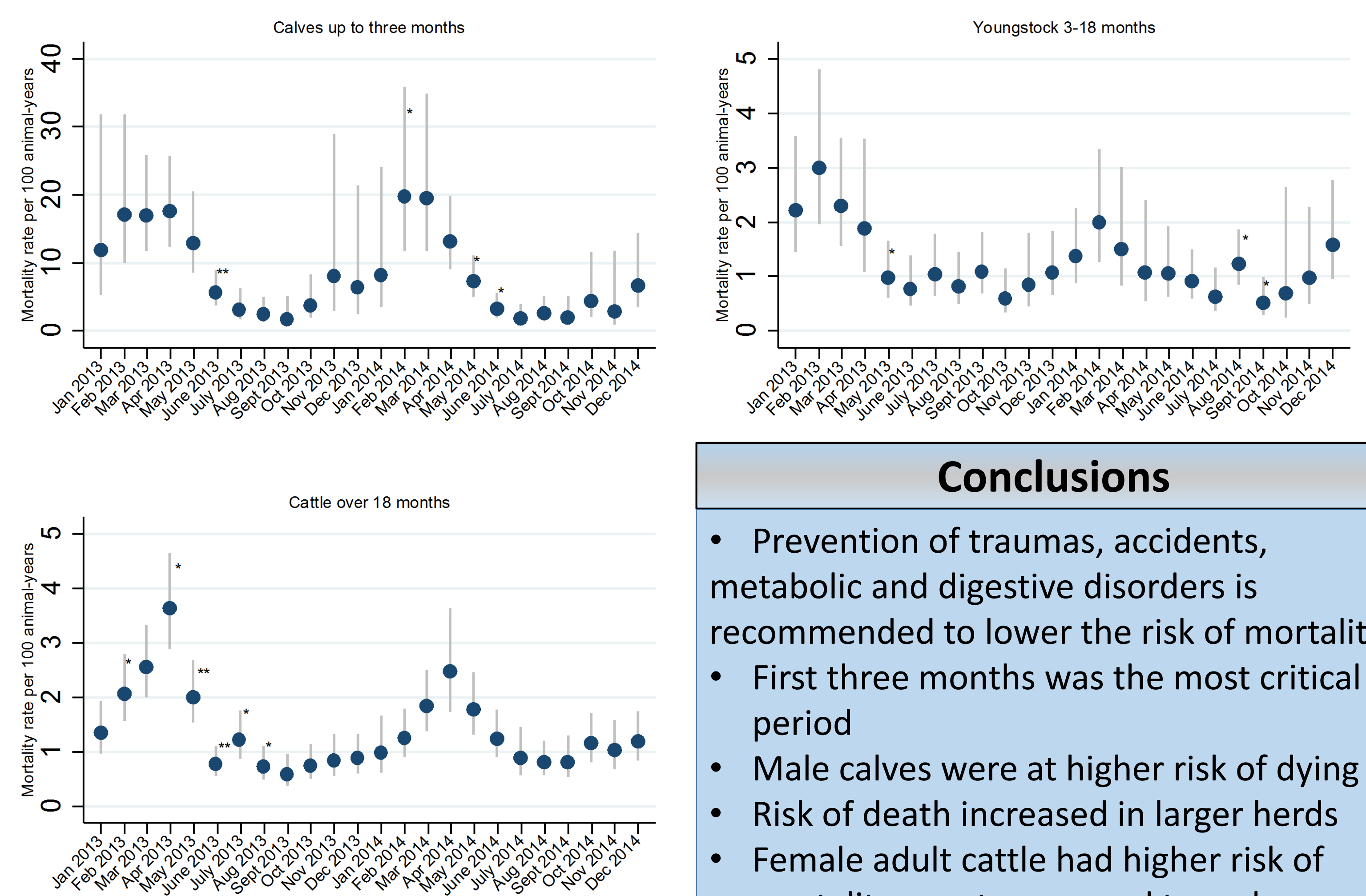
Table 2. Risk factors for on-farm beef cattle (3-18 months old) mortality including euthanasia in Weibull proportional hazard random effect model evaluated in 47,914 cattle from 1,243 herds

Variable	Category	n (%) ^{ab}	HR	95% CI	P-value	Wald test P-value
Age category ^b	3-6 months	35,028 (33.12)	1			0.006
	6-12 months	41,175 (38.93)	1.46	1.15; 1.86	0.002	
	12-18 months	29,569 (27.96)	1.20	0.93; 1.55	0.160	
Gender ^a	Female	24,920 (52.01)	1			0.001
	Male	22,914 (47.99)	1.34	1.12; 1.60		

^aNumber of animals in each category

^bNumber of observations in each category after splitting the observations according to age categories

Seasonal distribution of mortality (on-farm death and euthanasia) rate in years 2013 and 2014



*p<0.05 and **p<0.001 compared to previous month

Conclusions

- Prevention of traumas, accidents, metabolic and digestive disorders is recommended to lower the risk of mortality
- First three months was the most critical period
- Male calves were at higher risk of dying
- Risk of death increased in larger herds
- Female adult cattle had higher risk of mortality event compared to males
- Scottish Highland breed adult cattle experienced lowest risk of mortality
- Calving season shared increased mortality risk for all age groups

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