## Supplementary Materials

**Table S1**. Univariable analyses of the associations with sole and heel conformation score for 5672 foot-level observations of 400 ewes.

| Variable | *n* | % | β | Lower 95% CI | Upper 95% CI |
|---|---|---|---|---|---|
| *Sheep-level variables* | | | | | |
| **Age** | | | | | |
| < 4 years | 3528 | 62.2 | ref | | |
| ≥ 4 years | 2144 | 37.8 | **0.08** | 0.01 | 0.14 |
| **BCS** | | | | | |
| 3.0 | 2816 | 49.6 | ref | | |
| < 3.0 | 828 | 14.6 | 0.00 | -0.06 | 0.07 |
| > 3.0 | 2028 | 35.8 | **0.10** | 0.04 | 0.15 |
| *Foot-level variables* | | | | | |
| **Foot position** | | | | | |
| Front | 2836 | 50.0 | ref | | |
| Back | 2836 | 50.0 | **0.06** | 0.02 | 0.10 |
| **Number of other feet with poor sole and heel conformation (scores ≥ 1)** | | | | | |
| No other feet affected | 3306 | 58.3 | ref | | |
| One other foot affected | 1418 | 25.0 | **0.29** | 0.24 | 0.33 |
| Two other feet affected | 716 | 12.6 | **0.56** | 0.50 | 0.62 |
| Three other feet affected | 232 | 4.1 | **0.91** | 0.81 | 1.00 |
| **Clinical disease** | | | | | |
| No FR disease present | 5204 | 91.7 | ref | | |
| ID and/or SFR present | 468 | 8.3 | **0.28** | 0.20 | 0.35 |
| *Farm-level variables* | | | | | |
| **Vaccination status** | | | | | |
| Flock not vaccinated against footrot (Footvax®) | 2816 | 49.6 | ref | | |
| Flock vaccinated against footrot (Footvax®) | 2856 | 50.4 | 0.14 | -0.21 | 0.48 |
| **Soil type** | | | | | |
| Loamy | 1364 | 24.0 | ref | | |
| Clay | 2856 | 50.4 | 0.14 | -0.04 | 0.33 |
| Loamy/clay mix | 1452 | 25.6 | **0.38** | 0.17 | 0.60 |
| **Pasture moisture (calendar month of visit) (*n* = 4512)** | | | | | |
| Dry ("hard") | 996 | 22.1 | ref | | |
| Damp ("firm") | 2064 | 45.7 | **0.07** | 0.02 | 0.12 |
| Wet ("squelchy") | 1452 | 32.2 | **0.10** | 0.04 | 0.16 |
| Saturated ("boggy") | 0 | 0.0 | - | - | - |
| **Pasture moisture (lagged to previous calendar month)** | | | | | |
| Dry ("hard") | 1604 | 28.3 | ref | | |
| Damp ("firm") | 2140 | 37.7 | **0.11** | 0.06 | 0.16 |

| | | | | | |
|---|---|---|---|---|---|
| Wet ("squelchy") | 768 | 13.5 | **0.20** | 0.13 | 0.27 |
| Saturated ("boggy") | 1160 | 20.5 | **0.45** | 0.40 | 0.51 |
| **Pasture quality (calendar month of visit) (*n* = 4512)** | | | | | |
| Lush (~ 90% leafy rye grasses) | 2812 | 62.3 | ref | | |
| Average (~ 50% rye grasses) | 1700 | 37.7 | **0.15** | 0.09 | 0.21 |
| Poor (mostly stalk and weeds) | 0 | 0.0 | - | - | - |
| **Pasture quality (lagged to previous calendar month)** | | | | | |
| Lush (~ 90% leafy rye grasses) | 2516 | 44.4 | ref | | |
| Average (~ 50% rye grasses) | 2760 | 48.7 | **0.43** | 0.34 | 0.51 |
| Poor (mostly stalk and weeds) | 396 | 7.0 | **0.68** | 0.56 | 0.80 |
| **Pasture type (calendar month of visit) (*n* = 4512)** | | | | | |
| Permanent grassland | 1008 | 22.3 | ref | | |
| New grass ley | 752 | 16.7 | 0.13 | -0.20 | 0.47 |
| Mix permanent and new ley | 2752 | 61.0 | 0.09 | -0.24 | 0.42 |
| **Pasture type (lagged to previous calendar month)** | | | | | |
| Permanent grassland | 1768 | 31.2 | ref | | |
| New grass ley | 3584 | 63.2 | **-0.10** | -0.17 | -0.02 |
| Mix permanent and new ley | 320 | 5.6 | **-0.25** | -0.34 | -0.16 |
| **Sward height (calendar month of visit) (*n* = 4512)** | | | | | |
| Approx. 3 cm | 1876 | 41.6 | ref | | |
| Approx. 8 cm | 2324 | 51.5 | -0.03 | -0.07 | 0.02 |
| Approx. > 8 cm | 312 | 6.9 | **-0.21** | -0.29 | -0.12 |
| **Sward height (lagged to previous calendar month)** | | | | | |
| Approx. 3 cm | 2068 | 36.5 | ref | | |
| Approx. 8 cm | 3208 | 56.6 | **-0.12** | -0.17 | -0.06 |
| Approx. > 8 cm | 396 | 7.0 | **0.18** | 0.09 | 0.27 |
| **Rainfall (calendar month of visit)** | 5672 | 100.0 | 0.00 | 0.00 | 0.00 |
| **Rainfall (lagged to previous calendar month)** | 5672 | 100.0 | 0.00 | 0.00 | 0.00 |
| **Temperature (calendar month of visit)** | 5672 | 100.0 | **-0.03** | -0.03 | -0.02 |
| **Temperature (lagged to previous calendar month)** | 5672 | 100.0 | **-0.03** | -0.03 | -0.02 |
| *Time variable* | | | | | |
| **Visit** | | | | | |
| 1 (Sep 2019) | 1556 | 27.4 | ref | | |
| 2 (Jan 2020) | 1536 | 27.1 | **0.30** | 0.25 | 0.35 |
| 3 (Jul 2020) | 1356 | 23.9 | **-0.09** | -0.14 | -0.03 |
| 4 (Sep 2020) | 1224 | 21.6 | **-0.08** | -0.13 | -0.02 |

β: estimate; CI: confidence interval for estimate; bold estimates are statistically significant at 0.05 as their CIs do not include 0; ref: baseline category for comparison.

**Table S2**. Univariable analyses of the associations with hoof wall conformation score for 5672 foot-level observations of 400 ewes.

| Variable | n | % | β | Lower 95% CI | Upper 95% CI |
|---|---|---|---|---|---|
| *Sheep-level variables* | | | | | |
| **Age** | | | | | |
| < 4 years | 3528 | 62.2 | ref | | |
| ≥ 4 years | 2144 | 37.8 | **0.13** | 0.02 | 0.24 |
| **BCS** | | | | | |
| 3.0 | 2816 | 49.6 | ref | | |
| < 3.0 | 828 | 14.6 | **0.15** | 0.05 | 0.25 |
| > 3.0 | 2028 | 35.8 | 0.03 | -0.05 | 0.11 |
| *Foot-level variables* | | | | | |
| **Foot position** | | | | | |
| Front | 2836 | 50.0 | ref | | |
| Back | 2836 | 50.0 | **0.20** | 0.15 | 0.26 |
| **Number of other feet with poor hoof wall conformation (scores ≥ 1)** | | | | | |
| No other feet affected | 381 | 6.7 | ref | | |
| One other foot affected | 903 | 15.9 | **0.28** | 0.15 | 0.41 |
| Two other feet affected | 1551 | 27.3 | **0.63** | 0.50 | 0.75 |
| Three other feet affected | 2837 | 50.0 | **1.11** | 0.99 | 1.22 |
| **Clinical disease** | | | | | |
| No FR disease present | 5204 | 91.7 | ref | | |
| ID and/or SFR present | 468 | 8.3 | **0.28** | 0.17 | 0.39 |
| *Farm-level variables* | | | | | |
| **Vaccination status** | | | | | |
| Flock not vaccinated against footrot (Footvax®) | 2816 | 49.6 | ref | | |
| Flock vaccinated against footrot (Footvax®) | 2856 | 50.4 | -0.12 | -0.55 | 0.32 |
| **Soil type** | | | | | |
| Loamy | 1364 | 24.0 | ref | | |
| Clay | 2856 | 50.4 | -0.07 | -0.35 | 0.22 |
| Loamy/clay mix | 1452 | 25.6 | **-0.40** | -0.73 | -0.07 |
| **Pasture moisture (calendar month of visit) (n = 4512)** | | | | | |
| Dry ("hard") | 996 | 22.1 | ref | | |
| Damp ("firm") | 2064 | 45.7 | **0.09** | 0.01 | 0.17 |
| Wet ("squelchy") | 1452 | 32.2 | **-0.31** | -0.41 | -0.21 |
| Saturated ("boggy") | 0 | 0.0 | - | - | - |
| **Pasture moisture (lagged to previous calendar month)** | | | | | |
| Dry ("hard") | 1604 | 28.3 | ref | | |
| Damp ("firm") | 2140 | 37.7 | **-0.13** | -0.21 | -0.05 |
| Wet ("squelchy") | 768 | 13.5 | **-0.17** | -0.28 | -0.07 |
| Saturated ("boggy") | 1160 | 20.5 | **-0.13** | -0.21 | -0.04 |
| **Pasture quality** | | | | | |

| | | | β | CI | CI |
|---|---|---|---|---|---|
| **(calendar month of visit) (*n* = 4512)** | | | | | |
| Lush (~ 90% leafy rye grasses) | 2812 | 62.3 | ref | | |
| Average (~ 50% rye grasses) | 1700 | 37.7 | **0.44** | 0.36 | 0.53 |
| Poor (mostly stalk and weeds) | 0 | 0.0 | - | - | - |
| **Pasture quality** | | | | | |
| **(lagged to previous calendar month)** | | | | | |
| Lush (~ 90% leafy rye grasses) | 2516 | 44.4 | ref | | |
| Average (~ 50% rye grasses) | 2760 | 48.7 | **-0.17** | -0.29 | -0.05 |
| Poor (mostly stalk and weeds) | 396 | 7.0 | **-0.19** | -0.36 | -0.01 |
| **Pasture type** | | | | | |
| **(calendar month of visit) (*n* = 4512)** | | | | | |
| Permanent grassland | 1008 | 22.3 | ref | | |
| New grass ley | 752 | 16.7 | **-0.74** | -0.83 | -0.66 |
| Mix permanent and new ley | 2752 | 61.0 | **-0.08** | -0.15 | -0.02 |
| **Pasture type** | | | | | |
| **(lagged to previous calendar month)** | | | | | |
| Permanent grassland | 1768 | 31.2 | ref | | |
| New grass ley | 3584 | 63.2 | **-0.50** | -0.60 | -0.39 |
| Mix permanent and new ley | 320 | 5.6 | **-0.62** | -0.75 | -0.49 |
| **Sward height** | | | | | |
| **(calendar month of visit) (*n* = 4512)** | | | | | |
| Approx. 3 cm | 1876 | 41.6 | ref | | |
| Approx. 8 cm | 2324 | 51.5 | **0.61** | 0.54 | 0.67 |
| Approx. > 8 cm | 312 | 6.9 | **0.53** | 0.39 | 0.67 |
| **Sward height** | | | | | |
| **(lagged to previous calendar month)** | | | | | |
| Approx. 3 cm | 2068 | 36.5 | ref | | |
| Approx. 8 cm | 3208 | 56.6 | -0.08 | -0.16 | 0.00 |
| Approx. > 8 cm | 396 | 7.0 | **-0.20** | -0.32 | -0.07 |
| **Rainfall (calendar month of visit)** | 5672 | 100.0 | **-0.01** | -0.01 | -0.01 |
| **Rainfall (lagged to previous calendar month)** | 5672 | 100.0 | **0.01** | 0.01 | 0.01 |
| **Temperature (calendar month of visit)** | 5672 | 100.0 | **-0.03** | -0.04 | -0.02 |
| **Temperature (lagged to previous calendar month)** | 5672 | 100.0 | -0.01 | -0.01 | 0.00 |
| *Time variable* | | | | | |
| **Visit** | | | | | |
| 1 (Sep 2019) | 1556 | 27.4 | ref | | |
| 2 (Jan 2020) | 1536 | 27.1 | **0.32** | 0.25 | 0.40 |
| 3 (Jul 2020) | 1356 | 23.9 | **0.30** | 0.22 | 0.37 |
| 4 (Sep 2020) | 1224 | 21.6 | **0.61** | 0.53 | 0.69 |

β: estimate; CI: confidence interval for estimate; bold estimates are statistically significant at 0.05 as their CIs do not include 0; ref: baseline category for comparison.

**Table S3**. Univariable analyses of the associations with hoof wall overgrowth score for 5672 foot-level observations of 400 ewes.

| Variable | *n* | % | β | Lower 95% CI | Upper 95% CI |
|---|---|---|---|---|---|
| *Sheep-level variables* | | | | | |
| **Age** | | | | | |
| < 4 years | 3528 | 62.2 | ref | | |
| ≥ 4 years | 2144 | 37.8 | **0.17** | 0.05 | 0.28 |
| **BCS** | | | | | |
| 3.0 | 2816 | 49.6 | ref | | |
| < 3.0 | 828 | 14.6 | **0.51** | 0.41 | 0.62 |
| > 3.0 | 2028 | 35.8 | **-0.46** | -0.54 | -0.37 |
| *Foot-level variables* | | | | | |
| **Foot position** | | | | | |
| Front | 2836 | 50.0 | ref | | |
| Back | 2836 | 50.0 | **-0.54** | -0.60 | -0.49 |
| **Number of other feet with hoof wall overgrowth present (scores ≥ 1)** | | | | | |
| No other feet affected | 728 | 12.8 | ref | | |
| One other foot affected | 672 | 11.8 | **0.57** | 0.45 | 0.68 |
| Two other feet affected | 900 | 15.9 | **0.73** | 0.62 | 0.85 |
| Three other feet affected | 3372 | 59.4 | **1.72** | 1.63 | 1.82 |
| **Clinical disease** | | | | | |
| No FR disease present | 5204 | 91.7 | ref | | |
| ID and/or SFR present | 468 | 8.3 | **-0.38** | -0.50 | -0.26 |
| *Farm-level variables* | | | | | |
| **Vaccination status** | | | | | |
| Flock not vaccinated against footrot (Footvax®) | 2816 | 49.6 | ref | | |
| Flock vaccinated against footrot (Footvax®) | 2856 | 50.4 | -0.68 | -1.95 | 0.60 |
| **Soil type** | | | | | |
| Loamy | 1364 | 24.0 | ref | | |
| Clay | 2856 | 50.4 | **-0.82** | -1.23 | -0.41 |
| Loamy/clay mix | 1452 | 25.6 | **-1.59** | -2.07 | -1.12 |
| **Pasture moisture (calendar month of visit) (*n* = 4512)** | | | | | |
| Dry ("hard") | 996 | 22.1 | ref | | |
| Damp ("firm") | 2064 | 45.7 | **-0.62** | -0.69 | -0.54 |
| Wet ("squelchy") | 1452 | 32.2 | **-1.08** | -1.18 | -0.98 |
| Saturated ("boggy") | 0 | 0.0 | - | - | - |
| **Pasture moisture (lagged to previous calendar month)** | | | | | |
| Dry ("hard") | 1604 | 28.3 | ref | | |
| Damp ("firm") | 2140 | 37.7 | **-0.57** | -0.65 | -0.50 |
| Wet ("squelchy") | 768 | 13.5 | **-1.50** | -1.60 | -1.40 |
| Saturated ("boggy") | 1160 | 20.5 | **0.24** | 0.15 | 0.32 |
| **Pasture quality** | | | | | |

| | | | β | CI | CI |
|---|---|---|---|---|---|
| **(calendar month of visit) (*n* = 4512)** | | | | | |
| Lush (~ 90% leafy rye grasses) | 2812 | 62.3 | ref | | |
| Average (~ 50% rye grasses) | 1700 | 37.7 | **-0.13** | -0.22 | -0.04 |
| Poor (mostly stalk and weeds) | 0 | 0.0 | - | - | - |
| **Pasture quality** | | | | | |
| **(lagged to previous calendar month)** | | | | | |
| Lush (~ 90% leafy rye grasses) | 2516 | 44.4 | ref | | |
| Average (~ 50% rye grasses) | 2760 | 48.7 | **1.93** | 1.81 | 2.05 |
| Poor (mostly stalk and weeds) | 396 | 7.0 | **1.13** | 0.96 | 1.30 |
| **Pasture type** | | | | | |
| **(calendar month of visit) (*n* = 4512)** | | | | | |
| Permanent grassland | 1008 | 22.3 | ref | | |
| New grass ley | 752 | 16.7 | -1.12 | -3.94 | 1.69 |
| Mix permanent and new ley | 2752 | 61.0 | -0.53 | -3.34 | 2.29 |
| **Pasture type** | | | | | |
| **(lagged to previous calendar month)** | | | | | |
| Permanent grassland | 1768 | 31.2 | ref | | |
| New grass ley | 3584 | 63.2 | **0.81** | 0.67 | 0.95 |
| Mix permanent and new ley | 320 | 5.6 | **0.58** | 0.46 | 0.69 |
| **Sward height** | | | | | |
| **(calendar month of visit) (*n* = 4512)** | | | | | |
| Approx. 3 cm | 1876 | 41.6 | ref | | |
| Approx. 8 cm | 2324 | 51.5 | **0.14** | 0.07 | 0.20 |
| Approx. > 8 cm | 312 | 6.9 | **-0.25** | -0.39 | -0.11 |
| **Sward height** | | | | | |
| **(lagged to previous calendar month)** | | | | | |
| Approx. 3 cm | 2068 | 36.5 | ref | | |
| Approx. 8 cm | 3208 | 56.6 | **-0.41** | -0.49 | -0.33 |
| Approx. > 8 cm | 396 | 7.0 | **-1.10** | -1.22 | -0.97 |
| **Rainfall (calendar month of visit)** | 5672 | 100.0 | 0.00 | 0.00 | 0.00 |
| **Rainfall (lagged to previous calendar month)** | 5672 | 100.0 | 0.00 | 0.00 | 0.00 |
| **Temperature (calendar month of visit)** | 5672 | 100.0 | **0.12** | 0.11 | 0.13 |
| **Temperature (lagged to previous calendar month)** | 5672 | 100.0 | **-0.02** | -0.02 | -0.01 |
| *Time variable* | | | | | |
| **Visit** | | | | | |
| 1 (Sep 2019) | 1556 | 27.4 | ref | | |
| 2 (Jan 2020) | 1536 | 27.1 | **0.46** | 0.38 | 0.53 |
| 3 (Jul 2020) | 1356 | 23.9 | **0.62** | 0.53 | 0.70 |
| 4 (Sep 2020) | 1224 | 21.6 | 0.05 | -0.04 | 0.13 |

β: estimate; CI: confidence interval for estimate; bold estimates are statistically significant at 0.05 as their CIs do not include 0; ref: baseline category for comparison.