

Sand bedding

Ruth Davis, SimHerd 01-06-2021

Changing from mattress to sand bedding can improve cow welfare and milk production. The largest effects can be seen on claw and leg health in combination with an improved udder health. Due to the sand bedding the amount of time lying is often increased substantially which results in an increased milk yield. All these effects need to be captured, to simulate the effect of sand bedding.

When you have created your herd and calibrated the data, you can create a scenario.

(NB: It is very important that the correct amount of diseases is entered in the herd data. If no or a low level of diseases is entered the effect of sand bedding will be underestimated)

1) Reduce the risk of "claw and leg problems, Digital Dermatitis and foul in the foot" (category -> diseases) with **42%** (multiply the key figures with 0,58).

| erview Herds rage 11 <u>t</u> | | | 0 1 1 0 Data | Calibration | Overview | Prices | Report | 2 | | Standard ID: SHI_26038 Created by: drol(2)smicroom Date: 9/42020 10:02:19 AM Herd file: Scanario no: Created by:SHI_218313 Created by: bd(2)smicroom Date: 9/24/2020 11:36:30 AM |
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| | | | Sta | andard | | Scenarie | | | | |
| Save | | | | | | | | | Sand | <pre>comments - Effect of changing to bedding </pre> |
| Youngstock | | Key figure | | | | | | Standard | | Unit |
| Disease | 6 | Milk fever | | | | | 0 | 5.0 | (5.0) | basis risiko |
| | 7 | Dystocia | | | | | 0 | 1.9 | 1.9 | basis risiko |
| | | | | | | | | | | |
| Reproduction and Culling | 8 | Retained placenta | | | | | 0 | 9.3 | 9.3 | basis risiko |
| Milk yield | 8 | | | | | | 0 | 9.3 | | basis risiko basis risiko |
| Milk yield -Control and Settings | | Metritis | | | | | | | 9.4 | |
| Milk yield -Control and Settings -Repro | 9 10 | Metritis | | | | | 0 | 9.4 | 9.4 2.1 | basis risiko |
| Milk yield -Control and Settings -Repro -Feeding | 9 10 11 | Metritis Displaced Abomesum Ketosis | | | | | 9 | 9.4 | 9.4 2.1 13.5 | basis risiko basis risiko basis risiko |
| Milk yield -Control and Settings -Repro -Feeding -Yield | 9 10 11 12 | Metritis Displaced Abomesum Ketosis Mastitis | | | | | 0 0 0 | 9.4 2.1 13.5 | 9.4 2.1 13.5 35.5 | basis risiko basis risiko basis risiko basis risiko |
| Milk yield -Control and Settings -Repro -Feeding -Yield -Youngstock | 9 10 11 12 13 | Metritis Displaced Abomesum Ketosis Mastitis Digital Dermatitis | | | | | 9 9 9 9 9 | 9.4 2.1 13.5 35.5 43.2 | 9.4 2.1 13.5 35.5 25 | basis risiko basis risiko basis risiko basis risiko basis risiko |
| Milk yield -Control and Settings -Repro -Feeding -Yield -Youngstock -Milk fever | 9 10 11 12 13 14 | Metritis Displaced Abomesum Ketosis Mastitis Digital Dermatitis Foul in the foot | | | | | 9 9 9 9 9 | 9.4 2.1 13.5 35.5 43.2 4.4 | 9.4 2.1 13.5 35.5 25 2,5 | basis risiko basis risiko basis risiko basis risiko basis risiko |
| Milk yield -Control and Settings -Repro -Feeding -Yield -Youngstock -Milk fever -Dystocia | 9 10 11 12 13 14 15 | Metritis Displaced Abomesum Ketosis Mastitis Digital Dermatitis Foul in the foot Claw and leg problems | | | | | 9 9 9 9 9 9 9 | 9.4 2.1 13.5 35.5 43.2 4.4 26.7 | 9.4 2.1 13.5 35.5 25 2,5 15,5 | basis risiko basis risiko basis risiko basis risiko basis risiko basis risiko basis risiko |
| Milk yield -Control and Settings -Repro -Feeding -Yield -Youngstock -Milk fever | 9 10 11 12 13 14 15 16 | Metritis Displaced Abomesum Ketosis Mastitis Digital Dermatitis Foul in the foot | | | | | 9 9 9 9 9 | 9.4 2.1 13.5 35.5 43.2 4.4 | 9.4 2.1 13.5 35.5 25 2,5 15,5 | basis risiko basis risiko basis risiko basis risiko basis risiko |



2) Reduce the risk of mastitis with 27 % (multiply with 0,73)

| rview Herds age | | | 61 | | Overview | | | | | Standard ID: SHI_26038 Created by: rbd@simherd.com Date: 9/4/2020 10:02:19 AM |
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| | | | Data | Calibration | Scenario | Prices | Report | | | Date: 9/24/2020 11:36:30 AM |
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| Save Simulation : | | | | | | | | | Sand | <u>omments</u> - Effect of changing bedding |
| Youngstock | | Key figure | | | | | | Standard | | Unit |
| Disease | - | Milk fever | | | | | 0 | 5.0 | 5.0 | basis risiko |
| | 7 | Dystocia | | | | | | 1.9 | [1.9] | |
| Reproduction and Culling | | | | | | | 0 | | | basis risiko |
| Reproduction and Culling Milk vield | | Retained placenta | | | | | 0 | 9.3 | 9.3 | basis risiko |
| Milk yield | _ | Retained placenta Metritis | | | | | - | | | |
| Milk yield Control and Settings | 9 | | | | | | 0 | 9.3 | 9.3 | basis risiko |
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| Milk yield -Control and Settings -Repro -Feeding | 9 10 11 | Metritis Displaced Abomesum | | | | | 0 0 0 | 9.3 9.4 2.1 | 9.3 9.4 2.1 13.5 | basis risiko basis risiko basis risiko |
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| Milk yield -Control and Settings -Repro -Feeding -Yield | 9 10 11 12 13 | Metritis Displaced Abomesum Ketosis Mastitis | | | | | 9 9 9 9 9 | 9.3 9.4 2.1 13.5 35.5 | 9.3 9.4 2.1 13.5 25,9 25 | basis risiko basis risiko basis risiko basis risiko basis risiko |
| Milk yield -Control and Settings -Repro -Feeding -Yield -Youngstock | 9 10 11 12 13 14 | Metritis Displaced Abornesum Ketosis Mastitis Digital Dermatitis | | | | | 6 6 6 6 6 6 | 9.3 9.4 2.1 13.5 35.5 43.2 | 9.3 9.4 2.1 13.5 25 25 25 | basis risiko basis risiko basis risiko basis risiko basis risiko basis risiko |
| Milk yield -Control and Settings -Repro -Feeding -Yield -Youngstock -Milk fever | 9 10 11 12 13 14 15 | Metritis Displaced Abomesum Ketosis Mastitis Digital Dermatitis Foul in the foot | | | | | 9 9 9 9 9 9 9 | 9.3 9.4 2.1 13.5 35.5 43.2 4.4 | 9.3 9.4 2.1 13.5 25 25 25 | basis risiko basis risiko basis risiko basis risiko basis risiko basis risiko basis risiko |

3) Increase the peak yield of all parities with 4 % (multiply 1,04)

| verview Herds erage 111 Lit | Overview 01 Image: Calibration Image: Calibration </th <th>Standard ID: SHI_26038 Created by: rbd@simherd.com Date: 9/4/2020 10 02:19 AM Herd file: Scanario no.: SHI_218313 Created by: rbd@simherd.com Date: 9/24/2020 11:36:30 AM</th> | Standard ID: SHI_26038 Created by: rbd@simherd.com Date: 9/4/2020 10 02:19 AM Herd file: Scanario no.: SHI_218313 Created by: rbd@simherd.com Date: 9/24/2020 11:36:30 AM |
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| | Standard Scenarie | |
| Simulation : status | | <u>Comments</u> Sand - Effect of changing to |
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| | | |
| | Key figure | Standard Scenario Unit |
| Youngstock | | |
| Youngstock Disease | 27 Peak yield of healthy parity 1 cows | 32.8 33,1 kg EKM per dag |
| - | 27 Peak yield of healthy parity 1 cows 28 Peak yield of healthy parity 2 cows | 32.8 33,1 kg EKM per dag 42.5 44,2 kg EKM per dag |
| Disease | 27 Peak yield of healthy parity 1 cows 28 Peak yield of healthy parity 2 cows 29 Peak yield of healthy parity 3+ cows | 32.8 33,1 kg EKM per dag 42.5 44,2 kg EKM per dag 44.8 46,6 kg EKM per dag |
| Disease Reproduction and Culling | 27 Peak yield of healthy parity 1 cows 28 Peak yield of healthy parity 2 cows 29 Peak yield of healthy parity 3+ cows 30 Persistency, parity 1 | 32.8 33.1 kg EKM per dag 42.5 44.2 kg EKM per dag 44.8 46,6 kg EKM per dag 13 13 % fald fra dag 60 til 305 |
| Disease Reproduction and Culling Milk yield | 27 Peak yield of healthy parity 1 cows 28 Peak yield of healthy parity 2 cows 29 Peak yield of healthy parity 3+ cows | 32.8 33.1 kg EKM per dag 42.5 44.2 kg EKM per dag 44.8 46.6 kg EKM per dag 13 13 % fald fra dag 60 til 305 |
| Disease Reproduction and Culling Milk yield -Control and Settings -Repro | 27 Peak yield of healthy parity 1 cows 28 Peak yield of healthy parity 2 cows 29 Peak yield of healthy parity 3+ cows 30 Persistency, parity 1 | 32.8 33.1 kg EKM per dag 42.5 44.2 kg EKM per dag 44.8 46,6 kg EKM per dag 13 13 % fald fra dag 60 til 305 30 30 % fald fra dag 60 til 305 |
| Disease Reproduction and Culling Milk yield -Control and Settings | 27 Peak yield of healthy parity 1 cows 28 Peak yield of healthy parity 2 cows 29 Peak yield of healthy parity 3* cows 30 Persistency, parity 1 31 Persistency, parity 2 | 32.8 33.1 kg EKM per dag 42.5 44.2 kg EKM per dag 44.8 46,6 kg EKM per dag 13 13 % fald fra dag 60 til 305 30 30 % fald fra dag 60 til 305 |

- Press save and run



4) Go to prices -> press use different prices in scenario and standard -> increase "other cost per cowyear" with 9,5 euros (70 DKK)

| verview Herds erage 111 lit | 91 Data | Overview | Report |) | Standard ID: SHI_26038 Created by: rbd@simherd.com Date: 94/2020 10:02:19 AM Herd file: SHI_218313 Created by: rbd@simherd.com Date: 9/24/2020 11:36:30 AI |
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| Feed | Save to userprofile 😢 Upload user | prices 设 Upload system | prices 😢 | Standard | Use different prices in scenario and stand Scenario Unit |
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| Feed Disease treatment (veterinary) Reproduction | Prices | prices 😮 Upload system | | Standard | Scenario Unit |
| Feed Disease treatment (veterinary) Reproduction Balance values | Prices Kapacitet Kapital | prices 😢 Upload system | 0 | Standard 972,89 | Scenario Unit 972,89 € 580,94 € |
| Feed Disease treatment (veterinary) Reproduction Balance values Other | Prices Kapacitet Kapital Other costs per cow-year | prices 😢 Upload system | 6 6 6 | Standard 972,89 580,94 164,43 | Scenario Unit 972,89) € 580,94) € 173,93) € |
| Feed Disease treatment (veterinary) Reproduction Balance values Other Labour Requirement | Prices Kapacitet Kapital Other costs per cow-year Labor, youngstock | prices 😢 Upload system | 6) 6) 6) | Standard 972,89 580,94 164,43 0,00 | Scenario Unit 972,89 € 580,94 € 173,93 € 0,00 € |
| Feed Disease treatment (veterinary) Reproduction Balance values Other Labour Requirement | Prices Kapacitet Kapital Other costs per cow-year Labor, youngstock Housing, youngstock | prices 😢 Upload system | 6) 6) 6) 6) 6) | Standard 972,89 580,94 164,43 0,00 23,49 | Scenario Unit 972,89 € 580,94 € 173,93 € 0,00 € 23,49 € |
| Feed Disease treatment (veterinary) Reproduction Balance values Other Labour Requirement | Prices Kapacitet Kapital Other costs per cow-year Labor, youngstock Housing, youngstock Other costs per heifer-year | prices 😢 Upload system | 6 6 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 | Standard 972,89 580,94 164,43 0,00 23,49 58,52 | Scenario Unit 972,89 € 580,94 € 173,93 € 0,00 € 23,49 € 585,52 € |
| Feed Disease treatment (veterinary) Reproduction Balance values Other Labour Requirement | Prices Kapacitet Kapital Other costs per cow-year Labor, youngstock Housing, youngstock Other costs per heifer-year Interest % | prices 😢 Upload system | 0 0 | Standard 972,89 580,94 164,43 0,00 23,49 58,52 4,00 | Scenario Unit 972,89 € 580,94 € 173,93 € 0,00 € 23,49 € 58,52 € 4,00 % |
| Feed Disease treatment (veterinary) Reproduction Balance values Other Labour Requirement | Prices Kapacitet Kapital Other costs per cow-year Labor, youngstock Housing, youngstock Other costs per helfer-year Interest % Cows per "animal unit" | prices 😢 Upload system | 0 | Standard 972,89 580,94 164,43 0,00 23,49 58,52 4,00 0,75 | Scenario Unit 972,89 € 580,94 € 173,93 € 0,000 € 23,49 € 585,52 € 4,000 % 0,755 Number |
| Milk and livestock Feed Disease treatment (veterinary) Reproduction Balance values Other Labour Requirement Alle | Prices Kapacitet Kapital Other costs per cow-year Labor, youngstock Housing, youngstock Other costs per heifer-year Interest % | prices 😢 Upload system | 0 0 | Standard 972,89 580,94 164,43 0,00 23,49 58,52 4,00 | Scenario Unit 972,89 € 580,94 € 173,93 € 0,00 € 23,49 € 58,52 € 4,00 % |

- Press use prices in report

All estimates are based on the following literature:

https://sp.landbrugsinfo.dk/Tvaerfaglige-emner/FarmTest/Sider/FarmTest-93-Sand-i-sengebaase.pdf

Cook, N. B. 2003. Prevalence of lameness among dairy cattle in Wisconsin as a function of housing type and stall surface. Journal of American Veterinary Medical Association 223: 1324 – 1328.

Cook, N. B. 2011. Cow comfort and health. (Online). Milkproduction.com. (Dato for citering: 7.12.2012). Dato for revision 18.04.2011. <u>http://www.milkproduction.com/Library/Scientific-articles/Housing/Cow-comfort-and-health/</u>.

Cook, N. B., T. B. Bennet & K. V. Norlund. 2004. Effect of free stall surface on daily activity patterns in dairy cows, with relevance to lameness prevalence. J. Dairy Sci. 87:2912-2922.