

Effect of rearing period of heifers and herd level of milk yield on performance and profitability



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The objective of this study was to evaluate the effects of variable intensity in rearing dairy heifers on 33 commercial dairy herds as reflected in age at first calving (AFC) and average daily weight gain (ADG) on production and reproduction traits and profitability. Milk yield (MY) during the production period was analyzed in relation to reproduction and economic parameters.

Material and methods

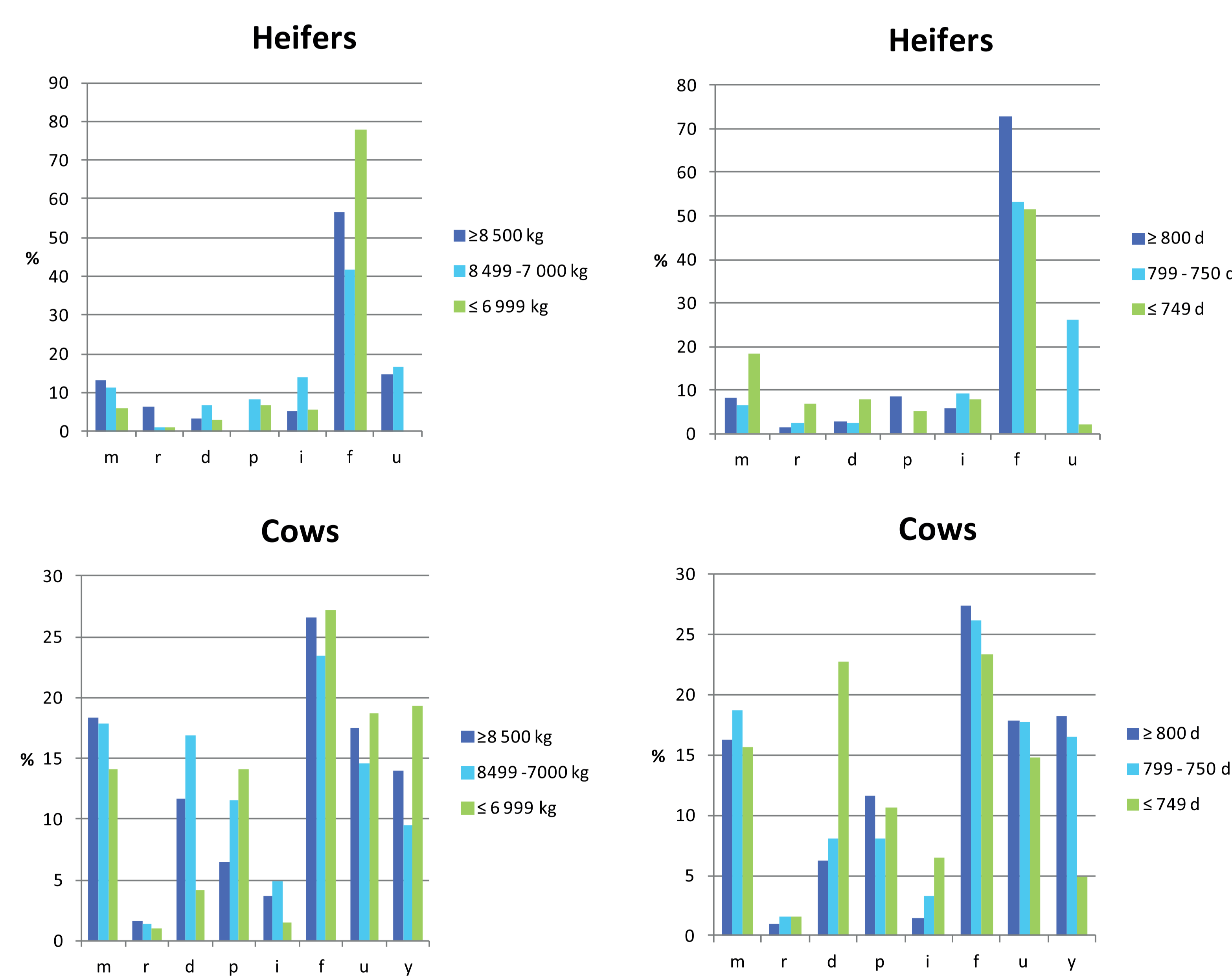
$$y_{ijkl} = \mu + B_i + R_j + D_k + e_{ijkl}$$

where y_{ijkl} = value of the dependent variable; μ = overall mean; B_i = i^{th} breed effect (i = 17 Holstein breed, 8 Czech Fleckvieh breed, 8 both breeds in the herd); R_j = effect of j^{th} region of farm (j = frequency of the studied farms [from 33 farms in total] in each of the 12 studied regions: South Bohemia – 1; South Moravia – 3; Hradec Králové – 2; Liberec – 1; Moravia–Silesia – 2; Olomouc – 3; Pardubice – 4; Pilsen – 4; Central Bohemia – 6; Ústí nad Labem – 2; Bohemian–Moravian Highlands – 4; Zlín – 1); D_k = effect of k^{th} AFC, ADG, or MY; e_{ijkl} = random error. Breed (B) was considered as a fixed effect and region of farm (R) as a random effect.

Data used in this study were recorded from 33 commercial dairy farms (17 having the Holstein breed, 8 with the Czech Fleckvieh breed, and 8 keeping both breeds in their herds). The investigation was carried out over a 1 yr period (2011) in the Czech Republic.

Results

Figure 1. Reasons for culling¹ of heifers (upper panels) and cows (lower panels) according to age at first calving (AFC) (right panels) and milk yield (MY) (left panels)



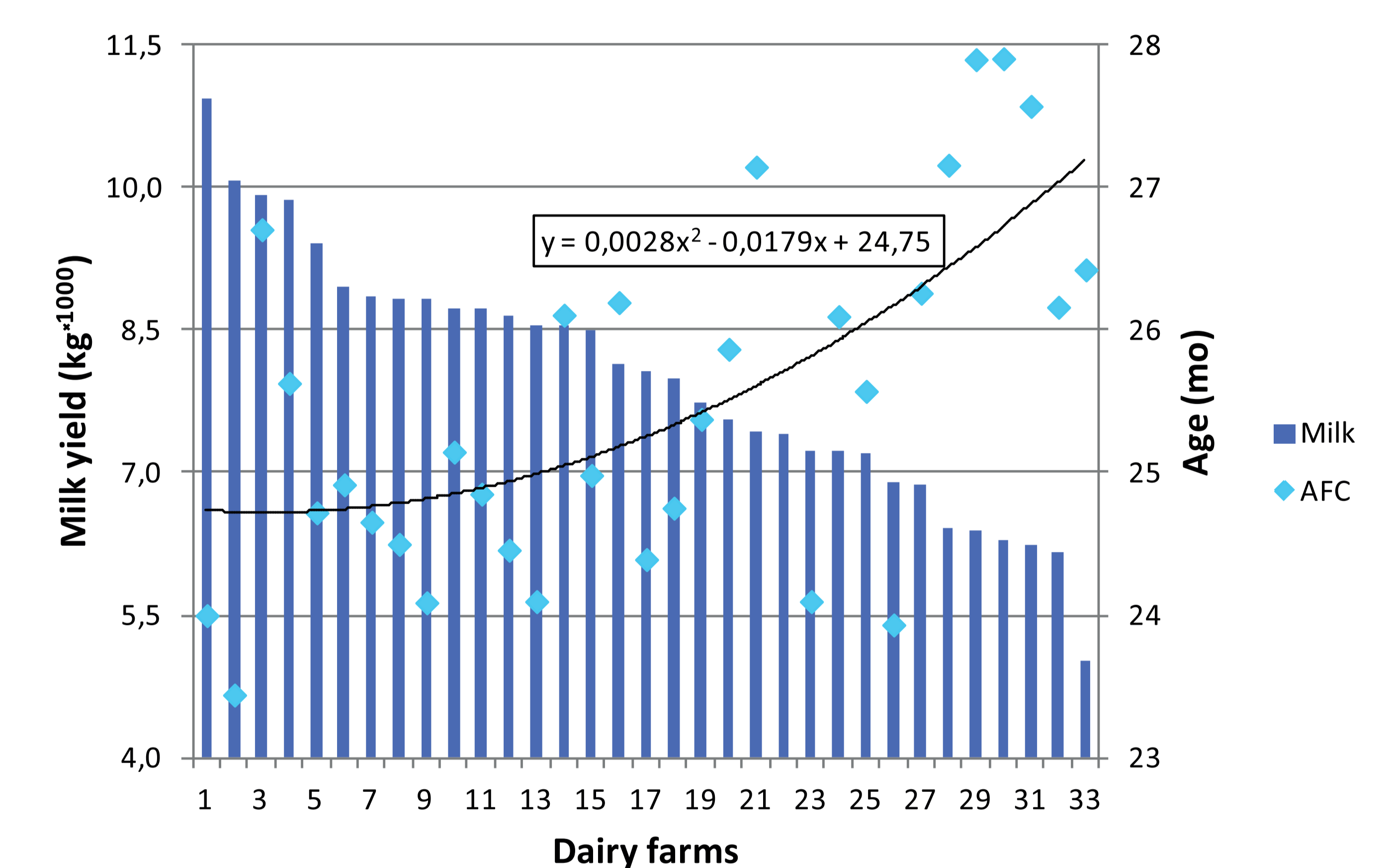
¹m = movement disorders, r = respiratory diseases, d = digestive diseases, p = post-partum complications, i = injuries, f = low fertility, u = mammary gland diseases, y = low milk production.

Low AFC does not always lead to the most profitable outcome in dairy herd management. Local conditions on each farm remain important, and a heifer-rearing period that is more intensive (AFC ≈ 24.5 mo) can lead to a decline in fertility, an increase in culling for cows, and perhaps a decrease in profit. The most profitable rearing approach was reflected in the middle AFC (799 to 750 d). The level of MY had a significant impact on profits on the studied farms. The profitability without subsidies in the group with highest MY (≥8,500 kg) was significantly the highest 2.67 %.

Conclusions

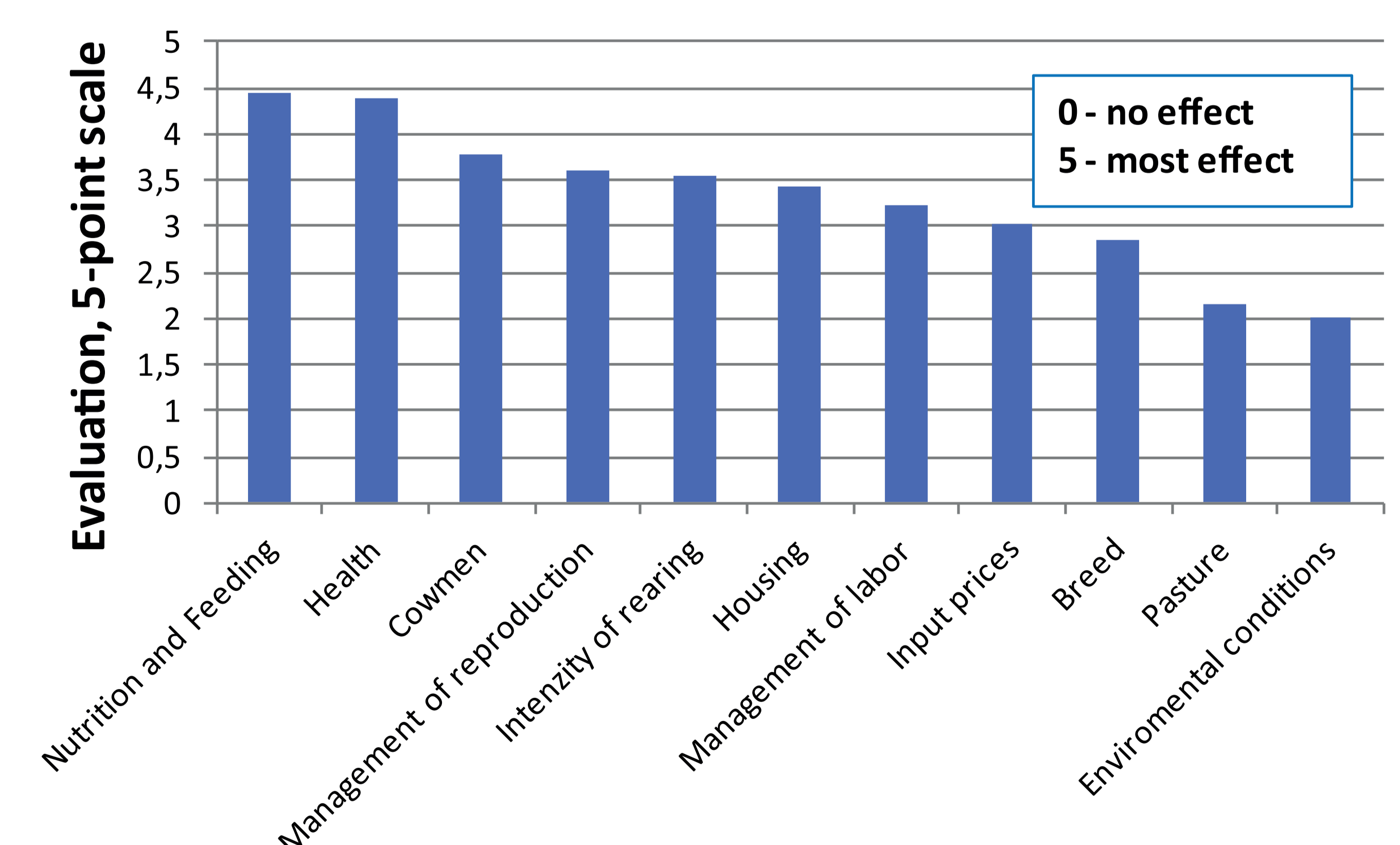
The probability for successful return on investment improves when the herd management is based on quality heifer rearing. Nevertheless, an optimal replacement policy does not guarantee good dairy farm profitability, which is greatly influenced by the changing prices of inputs and outputs on agricultural markets.

Figure 2. Relationship between age at first calving (AFC)¹ and milk yield (MY)



¹average body weight was 410 kg and average body weight in 6 mo of age was 193 kg

Figure 3. Impact of selected factors on the success in rearing period of heifers (subjective evaluation)



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