Is cows' qualitatively assessed behaviour towards humans related to their general stress level?

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Aim

To investigate the relation between cows' qualitatively assessed behaviour towards humans (QBA) and their general medium-term stress level (measured by faecal cortisol metabolites, FCM)

Fig. 1: Qualitative behaviour assessment (QBA)

related to a standardized human-animal interaction

Fig. 2: Faecal cortisol metabolites (FCM)

faeces collected freshly on the same day, reflecting adrenocortical activity over several hours

Animals and Methods

- **QBA** (Fig. 1) and **FCM** (Fig. 2) of **316 cows** ($\leq$ 200 days in milk) on 25 organic farms

- **QBA:** fixed list of 20 descriptors, specifically developed for this purpose (Fig. 3)

- **FCM:** competitive enzyme immunoassay measuring 11,17 dioxoandrostanes in ng/g fresh faeces

- **Statistics:**
  - analysis of QBA data by principal component analyses (PCA); PC1 reflected valence, PC2 activation (Fig. 3)
  - division of sample into 4 groups regarding combination of valence ('pos' / 'neg') and activation ('low' / 'high') (Fig. 4)
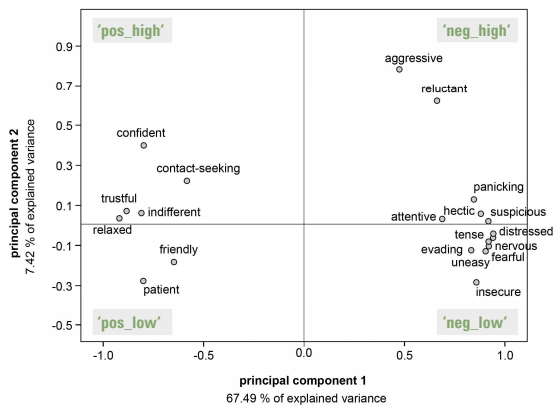 - group comparisons: Kruskall-Wallis test and Wilcoxon post hoc tests

Fig. 3: Component plot of PCA (no rotation, eigenvalue >1) on QBA data (n=622 cows) (Ebinghaus et al. 2017: Appl Animal Behav Sci 196:22-29)
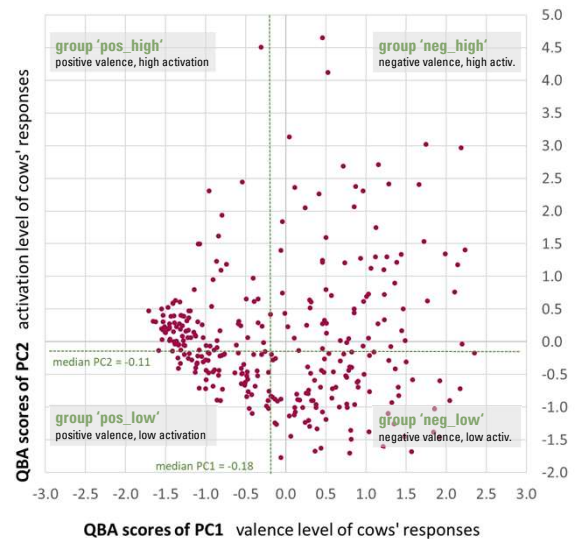

Fig. 4: Sample divided into 4 groups regarding valence and activation level of cows responses towards humans using PC1 and PCs medians as cut-points (n=316 cows)

Results

- FCM medians and variation were generally on a low level (Fig. 5)

- cows reacting 'pos_high' during human-animal interaction (n=65), 'pos_low' (n=93) and 'neg_low' (n=99) had similar FCM levels

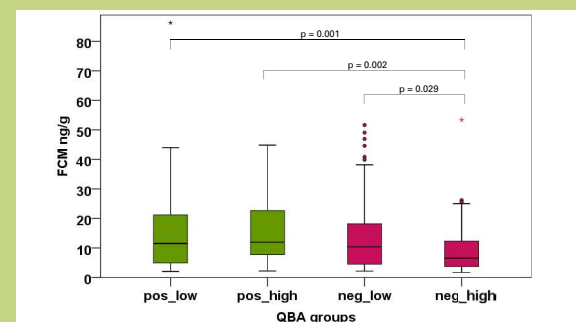- 'neg_high' cows (n=59) had significantly lower FCM levels than all other groups

Fig. 5: Differences in stress level measured by FCM between QBA groups (n=316 cows)

Conclusions

- 'neg_high' cows presumably had higher fear levels towards humans than 'pos' cows, and expressed this more actively than 'neg_low' cows

- unexpectedly, 'neg' reactions were not related to a higher stress level

- other factors such as social rank or health status might have affected results more profoundly, requiring a more complex analysis including individual factors

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www.uni-kassel.de/agrar/fnt

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