

# Animal-assisted therapy with farm animals for persons with psychiatric disorders

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**Summary.** Animal-assisted therapy (AAT) with farm animals for humans with psychiatric disorders may reduce depression and state anxiety, and increase self-efficacy, in many participants. Social support by the farmer appears to be important. Positive effects are best documented for persons with affective disorders or clinical depression. Effects may sometimes take a long time to be detectable, but may occur earlier if the participants are encouraged to perform more complex working skills. Progress must however be individually adapted allowing for flexibility, also between days. Therapists involved with mental health show a pronounced belief in the effects of AAT with farm animals, variation being related to type of disorder, therapist's sex and his/her experience with AAT. Research is still scarce and further research is required to optimize and individually adapt the design of farm animal-assisted interventions.

*Key words:* animal-assisted therapy, farm animals, depression, anxiety, self-efficacy.

**Riassunto** (*Terapie assistite con animali da fattoria in pazienti con disturbi psichiatrici*). Le terapie assistite con animali (TAA) da fattoria possono migliorare i sintomi depressivi e lo stato ansioso in pazienti psichiatrici, aumentando l'autoefficacia anche in soggetti sani. Il supporto sociale dell'allevatore sembra giocare un ruolo importante. Effetti positivi sono stati meglio documentati in pazienti con disturbi affettivi o con diagnosi di depressione. Gli effetti benefici sono in genere riscontrabili dopo lunghi periodi di tali terapie, anche se la loro efficacia può essere aumentata incoraggiando i pazienti a cimentarsi in compiti progressivamente più complessi, tenendo ovviamente conto delle loro individuali potenzialità. Vi è un crescente consenso tra gli operatori del settore della salute mentale rispetto all'efficacia delle TAA con animali da fattoria, sebbene gli effetti di tali pratiche terapeutiche varino con il tipo di patologia, il sesso del terapeuta e con l'esperienza di quest'ultimo con le TAA. La ricerca in quest'ambito è ancora insufficiente e sono necessari ulteriori studi finalizzati a ottimizzare e adattare al paziente la giusta strategia di intervento terapeutico con animali da fattoria.

*Parole chiave:* terapie assistite con gli animali, animali da fattoria, depressione, ansia, autoefficacia.

## INTRODUCTION

### *Animal-assisted interventions*

According to Kruger and Serpell, animal-assisted interventions (AAI) are defined as "any intervention that intentionally includes or incorporates animals as a part of a therapeutic or ameliorative process or milieu" [1]. AAI is used as a colloquial term that encompasses both animal-assisted therapy (AAT) and animal-assisted activities (AAA). AAT is a goal-directed intervention with animals as an integral part of the treatment process for a particular human client. The process is directed by a therapist who is practicing within the scope of his/her professional expertise [2]. AAA provides opportunities for motivational, educational, recreational, and/or therapeutic benefits to enhance quality of life and is delivered in a variety of environments by specially trained professionals and/or volunteers [2]. A variety of animal species can be used,

but it is recommended to restrict them to domesticated species, partly by considerations of the safety of the participants and partly in order to ensure adequate animal welfare. The most feasible species are therefore companion animals, equids and farm animals.

### *Animal-assisted interventions with farm animals in the context of Green care*

Green care is an inclusive term for many complex interventions such as social and therapeutic horticulture, animal-assisted therapy, care farming, green exercise, ecotherapy, wilderness therapy. Although there is much diversity under the umbrella of Green care, the term is grounded on the positive relationship between exposure of nature and human health [3]. Care farming (also called social farming or green care farming) is the use of commercial farms and agricultural landscapes as a base for promoting

human mental and physical health, social inclusion and educational benefits through normal farm activity [4, 5]. Most farms are ordinary family-based commercial farms, but also farms connected to health institutions and farms as part of therapeutic communities exist within Green care. Today the estimated number of Green care farms in Norway is 950 [6], and other European countries have similar figures [5, 7]. There is much variety among care farms, with differences in the extent of farm production or care, and in client groups. These may include persons with defined psychiatric diagnoses, people with learning disabilities, those with a drug history, disaffected youth or elderly people, as well as persons suffering from the effects of work-related stress or ill-health arising from obesity. Many care farms offer contact with farm livestock (AAA), while others provide specific AAT. Typically, the participants take part in the ordinary work tasks, like feeding animals, cleaning animals and the floor, perhaps also milking cows, but they are allowed to pet and interact with the animals as much as they like. Although animal-assisted interventions with farm animals appear to be the most thoroughly studied type of green care service, the evidence-based research is still scarce.

### *Theoretical framework of AAI*

Studies on AAI with farm animals usually assume that health effects are mediated by more or less the same mechanisms as for AAI with companion animals like dogs or cats. The theoretical foundations for the benefits of interacting with companion animals are poorly understood, and the plausible mechanisms are still to be confirmed. However, at least three mechanisms have stood the test of time.

According to the first, animals are able to induce and mediate physiologically de-arousing states of anxiety and arousal [8-10]. Souter and Miller conducted a meta-analysis to determine the effectiveness of AAT and AAA for reducing depressive symptoms in humans [11]. Only five studies, all using dogs, were identified. The mean effect size for the sample of studies was statistically significant, and the findings supported the hypothesis that AAA and AAT are effective at alleviating depression. A more comprehensive meta-analysis was conducted by Nimer and Lundahl identifying 49 studies that met the inclusion criteria [12]. The outcomes in the following four areas were studied; medical difficulties, autism-spectrum symptoms, behavioural problems, and emotional well-being. All studies identified moderate effect sizes in the improving outcomes, but research gaps on AAA and AAT were revealed [12]. Other studies have also confirmed a positive correlation between AAI and a decline in depression [13-15].

The second mechanism is that animals are suitable as mediators of human social interactions, and are capable of providing people with a kind of stress-buffering social support [16-19]. Social support is central in mental health rehabilitation, and is described as a person's

individual belief that one is cared for, esteemed and valued, and belongs to a network of communication and mutual obligations [20]. Several studies on Green care do emphasize the social setting and network building as important aspects [21, 22]. Perceived social support could therefore be an important mechanism in farm animal-assisted interventions.

The third mechanism is related to self-efficacy, a concept described as a person's belief that one can successfully produce the desired outcome [23]. A main source for increase in self-efficacy is a person's own accomplishment of a task or coping in a situation. Work and work-related activities are seen to help people to recover from mental health problems due to enhanced self-efficacy and coping [24, 25]. Farm animal-assisted interventions could be an excellent arena for coping and enhanced self-efficacy, as they provide a variety of work tasks easily adjusted to each person's requirement.

### AIM AND METHOD

Until now there are scarce evidence-based studies of interventions with farm animals for persons with psychiatric disorders. Based on the previous studies in this field, the aim of this paper is to give an overview of if or how farm animal-assisted interventions within the scope of Green care may enhance outcomes like coping, symptoms (mainly anxiety and depression), social support and quality of life for persons with psychiatric disorders. To identify relevant research articles related to Green care and farm animal-assisted interventions, search was done in major databases (PubMed, ISI Web of Science) for articles from peer-reviewed journals as well as the COST Action 866 report Green care: A conceptual framework [3]. In addition, proceedings from conferences and research reports presenting Green care and farm animal-assisted-interventions were included. All except one of the included studies are published within the last ten years. The referred studies are mainly based on adults with psychiatric diagnoses, but some have examined outcomes on adolescents with various mental disorders. In addition to the outcome mentioned, this paper will also report on attitudes to AAI among health professionals and farmers and discuss some practical implications of farm animal-based interventions.

### RESULTS

*Table 1* gives an overview of farm animal-assisted interventions related to randomized controlled trials (RCT), quasi-experimental studies and qualitative studies, including their main findings.

#### *Symptoms of depression and anxiety*

Several of the studies point out a decline in depression during a Green care intervention. A recent doctoral thesis on persons with clinical depression participating in a three-month intervention with dairy cattle, found a significant decline in depression in the

**Table 1** | Farm animal-assisted interventions and their main findings related to design (RCT, quasi-experimental and qualitative), sample and type of intervention

Author and year	Sample	No.	Intervention	Main findings
<b>RCT-design</b>				
Berget <i>et al.</i> , 2008 [31]	Adults with psychiatric disorders	69	12-week farm animal-assisted intervention	Increase in generalized self-efficacy in intervention compared to control group six months after end of interventions
Berget <i>et al.</i> , 2011 [28]	Adults with psychiatric disorders	69	12-week farm animal-assisted intervention	Decline in state anxiety in intervention compared to control group six months after end of interventions
Pedersen, 2011 [26]	Adults with clinical depression	14	12-week farm animal-assisted intervention	Decline in clinical depression during intervention
<b>Quasi-experimental</b>				
Ketelaars <i>et al.</i> , 2001 [30]	Adults with mental disorders		Stay at therapeutic community farm	Higher quality of life and lower mental distress including depression
Berget <i>et al.</i> , 2007 [32]	Adults with psychiatric disorders	35	Behavioural study during a 12-week farm animal-assisted intervention	Among persons with affective disorders, increased intensity of work correlated with increase in self-efficacy and decline in anxiety
Hine <i>et al.</i> , 2008 [29]	No specific target group	72	Stay at Green care farm	Increase in self-esteem and decrease in the POMS subscale for depression
Scholl <i>et al.</i> , 2008 [35]	Multi-disabled adults	10	10-week intervention with work and contact with goats	Increase in attentiveness and joy and decrease in retreat and apathy
Pedersen <i>et al.</i> , in press [27]	Adults with clinical depression	14	Behavioural study during a 12-week farm animal-assisted intervention	Decline in depression and anxiety and increase in self-efficacy are related to performance of complex work tasks
<b>Qualitative design</b>				
Mallon, 1994 [34]	Adolescence with behavioural and mental problems	80	Residential treatment centre	Farm visit alleviates difficult feelings via contact and communication with farm animals
Ketelaars <i>et al.</i> , 2001 [30]	Adults with mental disorders	31	Stay at therapeutic community farm	Important with easily adjusted work activities and the possibility to be a part of a community
Bjorgen and Johansen, 2007 [33]	Adults with mental disorders	15	Stay at Green care farms with work rehabilitation	The social setting and the farmer's commitment and conduct were important
Elings and Hassink 2008 [21]	Adults with mental health issues	21	Stay at Green care farm	Increase in self-confidence and the importance of a social setting, including the farmer
Hine <i>et al.</i> , 2008 [29]	No specific target group	72	Stay at Green care farm	The social setting, a feeling of achievement and the environment were enjoyed most
Hassink <i>et al.</i> , 2010 [22]	Health care professionals	27	Therapists with clients at Green care intervention	The non-care context with normal contact with society and other people via work was central

intervention group, but not in the waiting-list control group, as measured by Beck Depression Inventory (BDI) [26]. However, no significant difference between the intervention and control groups was found. The study also showed a favourable correlation between performing complex work tasks like milking procedures and a decline in depression, but an increase in depression was revealed among persons showing the most frequent animal contact. The latter finding may represent persons that did not manage to acquire more complex working skills and therefore remained with sole animal contact [27]. Berget *et al.* found no significant decline in depression (also with BDI) within the intervention group during a twelve-week farm animal-assisted intervention, mainly with dairy cattle, for a group of 41 participants with various psychiatric diagnoses (schizophrenia and schizotypal disorders, affective disorders, anxiety and stress-related disorders, and disorders of adult personality

and behaviour) [28]. The decline became significant from the start of intervention to end of the six-month follow-up period, although still not significantly different from the control group. An English study on Green care farming without a control group showed a significant decline in mood among 72 persons after a stay at a farm. The study was designed as an in-depth health benefit survey and included people suffering from physical, social and mental health problems [29]. Similarly, in a cross-sectional study within a therapeutic farm milieu for patients with mental disorders, the persons who were discharged (no. = 41) had higher quality of life (HLQ) and lower score on mental distress (SCL-90) compared to those who were admitted [30].

Few studies on farm animal-assisted interventions have addressed change in anxiety as an outcome, but the RCT design of Berget *et al.* found a decline in state anxiety at follow-up six months after the end of

a three-month intervention with farm animals for the treatment group compared with the control group, as measured by Spielberger state-trait anxiety inventory (state subscale, STAI-SS) [28]. Among the studied diagnoses, beneficial effects on anxiety tended to be higher among persons with affective disorders [28]. Among clinically depressed persons, Pedersen *et al.* found a significant association between showing high frequency of complex work tasks in the cowshed and a decline in state anxiety (STAI-SS) during the 12-week intervention [27]. Also persons who most frequently were talking to the farmer showed the largest reduction in anxiety [27].

### *Self-efficacy and self-esteem*

In the RCT study of Berget *et al.* the authors found no significant increase in self-efficacy, as measured by the generalized self-efficacy scale (GSE), within the intervention group during a twelve-week farm animal-assisted intervention [31]. However, there was a significant increase in self-efficacy in the treatment group but not in the control group from before intervention to six months follow-up and from end of intervention to follow-up. In Pedersen's study on clinically depressed persons, a significant increase in self-efficacy was found between time of recruitment and the end of the 12-week intervention in a cowshed [26]. In the study by Berget *et al.* increases in intensity and exactness in performed work tasks were significantly correlated to increase in self-efficacy for persons with affective disorders [32]. The same authors found an increase in performing milking procedures during the intervention which was linked to an increase in working skills. In the study of Hine *et al.*, 64% of the 72 participants within Green care experienced significant increase in self-esteem (Rosenberg self-esteem questionnaire) during the stay at a farm [29].

### *Social support*

Informational support, consisting of giving advice, information and instructions, is a natural part of farm animal-assisted interventions. Emotional support, comprising concern, listening and trust from farmers or other participants would possibly be a component, and the participants also often interpret close contact with farm animals as emotional support [27]. Appraisal support, with affirmation and feedback, is also likely to be a part of the contact between the farmer and the participant. This was also found in the doctoral thesis of Pedersen on farm animal-assisted interventions for patients with a clinical depression [26]. The participants in her study expressed that they felt the farmer understood their situation and that they could easily express how they felt. The farmer was also sensitive with regard to the participant's daily state. Qualitative studies in The Netherlands [21] and in Norway [33] have also emphasized the farmer contact and the social setting as important aspects for participants with mental health issues. An exploratory study at the Green Chimneys institution outside New York of 80 children with be-

havioural and mental health problems, showed that the children utilized the farm animals as if utilizing the service of a therapist; they visited the animals to feel better, and they learned about nutrition and caring for animals [34]. In a 12-week pilot project on AAI with goats for ten multiply-disabled adults (all deaf), the video registrations showed that the clients expressed joy and decreased withdrawal in contact with the goats. During the intervention the attentiveness and active participation increased. In contrast no such changes were found in a dining room situation with these persons [35].

### *Attitudes towards AAI*

In a Norwegian study aimed at examining experience and attitudes to Green care and AAT with farm animals for people with psychiatric disorders among psychiatric therapists (no. = 60; the majority being psychiatric nurses) and farmers (no. = 15) involved in our research project, most respondents had some or large knowledge about Green care [36]. However, the experience with Green care was generally low in both groups. Both farmers and therapists believed that AAT with farm animals could contribute positively to therapy to a large or very large extent, with farmers being significantly more positive. Most of the therapists thought that AAT with farm animals could contribute to increased skills in interactions with other humans, with female therapists being more positive than males. Two-thirds of the therapists believed that AAT with farm animals to a large extent could contribute better to mental health than other types of occupational therapy. There were no differences in attitudes to AAT between psychiatrists/psychologists and psychiatric nurses [36].

In a nationwide survey of opinions of AAIs for psychiatric patients among 1100 practitioners in Norway, the degree of belief in treatment effects (either to some degree or a high degree) varied between 56% and 87% depending on type of disorder and category of treatment effect [37]. The strongest degree of usefulness was reported for mental retardation while the least significant one was for schizophrenia disorders. The belief in treatment effects was highest for improved physical capacity and lowest for improved ability to communicate with other people and increased attention towards others. Those with a professional experience with AAI believed more in treatment effects than those without the same experience, and the female therapists believed more in treatment effects than their male colleagues [37].

Similar findings were supported by conclusions made by Hassink *et al.* who described Green care interventions as empowerment and coping, based on interviews with 41 clients, 33 care farmers, and 27 health care professionals [22]. The study showed that the care farms were experienced by the respondents as providing unique services because of a combination of different types of characteristic qualities: the personal and involved attitude of the farmer, a safe community, useful and diverse activities, and a green

environment. However, there were no essential differences in the assessment of characteristics between different client groups (clients with severe mental health problems, clients from youth care backgrounds, and frail elderly persons) or between clients, farmers, and health professionals [22].

## DISCUSSION

Research on animal-assisted interventions with the use of farm animals is rather new and therefore only provides scattered knowledge. Yet, the relatively few studies point to some common conclusions that appear to be generalizable. The most important conclusions will be discussed below, followed by some practical considerations, and finally suggestions for future research are given.

### *Effects on depression, anxiety, self-efficacy and social support*

Outcome effects of interventions should generally be related to the diagnoses and potentials for improvement in the individual participants. However, in research on green care and farm animal-assisted therapy a wide variety of diagnoses are often included in the same study. Effects on depression and state anxiety are frequently studied as they are aspects of quite many diagnoses related to mental health.

Several studies point to a reduction in depression among persons working with farm animals in AAI [26-30], in accordance with studies on companion animals [11, 13-15]. However, for some persons this is only evident during the follow-up period [28] or for those that acquire more complex working skills [27]. Reduction in depression is often found also in the control group in RCT studies, although to a lower degree.

The two RCT studies showed a reduction in anxiety for persons with affective disorders or clinical depression, more so the more time the persons spent with complex work tasks or in dialogue with the farmer [26, 28].

Another benefit of AAI is often ascribed as the ability of animals to act as living, interactive tools that can be used to help people see both themselves and the world in new ways, and add new skills and responses to their behavioural repertoires [38]. This is particularly relevant to the use of farm animals in AAI where variation in complexity of work tasks can easily be achieved. That is why the effect on self-efficacy is measured in such studies. People with low self-efficacy avoid difficult tasks; they lower their goals, and seek less support from others [23]. Both RCT studies found significant improvements in self-efficacy [26, 31] in the intervention group but not in the control group. This was associated with increased working performance or work complexity. These results point to the need for stimulating participants in AAI to try out new work tasks, but the progress must be adapted to the individual's needs including a proper flexibility [26].

Some studies point to the importance of the farmer as a provider of social support to the participants in farm animal-assisted interventions [21, 26, 33],

and some point to the role of the animal as a social partner [26, 34]. While working with farm animals, feeding or grooming them, the participants give care to the animal. This may stimulate or satisfy the role as a care giver among patients that are used to only receive care from health professionals.

In the RCT study by Berget *et al.* significant improvements in depression, anxiety and self-efficacy was found only after the half-year follow-up period [28, 31]. This indicates that positive effects of animal-assisted interventions sometimes may take long time to develop, or at least long time before the person realizes the effect. It is therefore important to avoid stopping an intervention at an early stage if no improvement is detected.

We suggest that, *a priori*, the same mechanisms that are considered to be operating during AAT with companion animals also may operate during AAT with farm animals. The potential for improving self-efficacy may be even higher with farm animals, considering the gradually increasing complexity of working skills that may easily be stimulated. We have earlier discussed AAI with animals in relation to the following mechanisms: (i) animals as social mediators, (ii) animals as facilitators of self-efficacy, (iii) animals as attachment figures, and (iv) animals as contributors of physiological changes [39]. These mechanisms are not mutually exclusive and several of them may be in operation in each individual.

### *Practical considerations*

Although an intervention with animals may be enjoyable for the participants, it does not necessarily have any therapeutic effect. The effects and mechanisms described above will be valuable for therapists and farmers in order to understand how interventions potentially may work, so the best practice procedures and programmes can be implemented in Green care or farm animal-assisted interventions. AAIs may need to involve local human service providers, veterinarians, ethologists and animal care providers.

Working with farm animals may positively affect human physical/physiological health by stimulating exercise and physical condition, also resulting in reduced stress and enhanced mental well-being. Therefore, measures of physical condition should be included among the instruments documenting health progress.

To make AAIs functioning well, a number of considerations need to be addressed. First, to organize the programmes it will be of advantage to establish an interdisciplinary advisory board with knowledge about the patients, the animals, authorities and organizations involved.

Second, it will be appropriate to establish lines of authority, duties of responsibility, and procedures of quality control. Farm animals may be heavy, so there is a risk of injuries. In our research projects, however, injuries to participants have never occurred. Injury risk can be reduced by ensuring that all involved animals are properly socialized on humans, to avoid fear or panic reactions during inadequate handling

of the animals. Particular care is needed if hyperactive or violent patients are involved. Participants need to be given clear instructions on handling the animals. Working with large animals provides its own coping potential for the participants.

Third, it is necessary to consider the welfare of the animals. Interventions with farm animals require knowledge of feeding requirements and routines, stall conditions, the animals' need for exercise, and possible animal diseases. Skilled stockpersons or farmers are needed as supervisors for the work to be done by the participants. This is particularly important if farm animals are brought into health institutions.

Fourth, it will be of importance to minimize sanitation needs, zoonotic problems, noise and other environmental impacts that could cause objections to AAI programmes. Finally, but not least important, as work with farm animals often functions as a kind of occupational therapy aiming at restoring the working capacity of the participants, individual flexibility should be ensured with plenty of time being allowed in physical contact with the animals, particularly when the participants have a "bad day".

#### **Further research required**

Although some theories are used to explain the effects of companion animals on human health, *e.g.* physiological changes, no coherent theory is established to explain the effects of farm animals on human health. One can assume that there is great, but perhaps not complete, overlap between these two major types of AAI. It will be of great importance to further develop a theoretical framework that also covers effects of farm animals on human mental health and well-being.

More research is needed to better understand to what extent and how farm animal-assisted therapy or interventions can benefit the participants. Studies are *e.g.* needed on whether participants can develop attachment to farm animals comparable to what can be observed with companion animals. If so, that might warrant AAI where participants are allowed

to focus their contact on one or a few individuals of farm animals. More research is needed to adapt the design of farm animal-assisted interventions to specific diagnoses or symptoms, and fit the AAI service to the needs of individual participants and to their potential for improvements and personal development. This would comprise studies on the choice of animal species, also as adapted to the personality of the participant, the type of work to be offered and the progress in work complexity, the social setting, and the frequency and length of each session.

#### **CONCLUSION**

Animal-assisted interventions with farm animals for humans with psychiatric disorders may reduce depression and state anxiety, and increase self-efficacy, in many participants. The social support by the farmer is important. Positive effects are best documented for persons with affective disorders or, more specifically, clinical depression. The effects may sometimes take a long time to be detectable. Effects may occur earlier if the participants are encouraged to experience and learn to master more complex working skills. Progress must however be individually adapted allowing for flexibility in relation to the day to day condition of the participant. Therapists involved with mental health show a pronounced belief in effects of AAT with farm animals, variation being related to type of mental problem, sex of the therapist and his/her experience with AAT. Research documentation is still scarce and further research is required to optimize and individually adapt the design of farm animal-assisted interventions.

#### **Conflict of interest statement**

There are no potential conflicts of interest or any financial or personal relationships with other people or organizations that could inappropriately bias conduct and findings of this study.

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