Welfare of working dogs and its impact on performance: research so far

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Previous work with working dogs

A variety of agencies
Working dog agencies
Applied research – working closely with end users
Using science to answer real-life questions
Why consider welfare?

Legal obligation

Mahatma Gandhi

"The greatness of a nation and its moral progress can be judged by the way its animals are treated"

Moral obligation

Animal Welfare Act 2006

Legal obligation

Mahatma Gandhi
Animal Welfare Act 2006 - A major landmark

Replaces 1911 Protection of Animals Act

Unnecessary suffering

A person commits an offence if -
(a) he is responsible for an animal,
(b) an act, or failure to act, of another person causes the animal to suffer,
(c) he permitted that to happen or failed to take such steps as were reasonable in all the circumstances to prevent that happening, and
(d) the suffering is unnecessary.

Animal Welfare Act 2006

Duty of person responsible for animal to ensure welfare

A person commits an offence if he does not take such steps to ensure that the needs of an animal for which he is responsible are met to the extent required by good practice.

An animal’s needs include -
(a) its need for a suitable environment,
(b) its need for a suitable diet,
(c) its need to be able to exhibit normal behaviour patterns,
(d) any need it has to be housed with, or apart from, other animals,
(e) its need to be protected from pain, suffering, injury and disease.
How do these apply to each species?

What are the biggest obstacles to meeting these needs?

**UK legislation – codes of practice**
Improving welfare often improves productivity

What about working dog performance?
What is welfare?

- Varies from very poor to very good
- Physical and psychological component

Good welfare

Physically fit and psychologically fulfilled

Three animal welfare concepts

Diagram after Appleby, MC. In: Appleby, MC and Hughes, BO. 1997 Animal Welfare. CAB International
A practical problem – how to improve productivity

- Climate of global terrorist threat
- Need increased numbers of higher quality teams

Which factors affect the working ability of dogs?

What produces the best search dog?
What factors predict a dog’s ultimate search ability?

- Gun or show line?
- Breeder’s treatment?
- Reaction to stress of kennelling?
- Behaviour in puppy test?
- Behaviour in adult test?
- Raised with other dogs?
- Puppy walker’s behaviour?
Change of environment

Physiological indicators

- cortisol (c/c ratio)
- hormone released in response to a stressor
- measure of short term stress
- two consecutive early morning urine samples
What factors predict a dog’s ultimate search ability?

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**Human-directed behaviour**

- Reacting to stress of kennelling
  - $\beta = -0.53$

- Gun-dog lines better than show-dog lines

- $\beta = 0.50$

- $\beta = -0.32$

**OVERALL ABILITY**
Stress and search ability

Stress linked to working ability

Links between stress and productivity

Chronic stress can result in

- Reduced meat and milk yield
- Decreased immune function
- Increased disease

- Welfare is linked to work rate in humans
- Victorian philosophy - Lord Leverhulme
- Guide dogs which are stressed regularly fail

Welfare is important
Stress linked to reduced performance

- Link between positive welfare and productivity
- Financial implications

Can we reduce stress and improve welfare?

Can we improve the welfare of kennelled dogs?

Alter the dog
choose dogs better able to cope with the environment

Alter the environment
to ameliorate stress for kennelled dogs
Alter the dogs to match the environment

Choose dogs better able to cope with the environment

- predict which animals will be most stressed?

Newly arrived dogs

Dogs from homes experienced more physiological stress

Hiby EF, Rooney NJ, & Bradshaw JWS, 2006, Physiology & Behavior 89
Introduce dogs to a kennel gradually

- 32 puppies
  - 16 kennel habituated
  - 16 non-kennelled

All reared in homes for 9 months
Value of gradual habituation

Alter the environment to ease the transition for the dog

Physical environment

- Kennel size
- Increase 3D space
- Give vantage points
- Heating

Provide heating or bedding

- Cold negatively affects dogs

Study of intake search dogs

- When temperatures drop dogs experience physiological stress
  
  \[ B = -0.399, p < 0.001. \]

- This is likely to result in reduced food efficiency

- Pointers were affected most followed by Spaniels, GSD’s, Labradors
Social environment

Contact with dogs

- Social animals
  - desire for social contact with other dogs
- Value of contact
  - Varies with past history
  - Can greatly improve welfare
- Limited time for positive contact with other dogs
We have selected dogs to crave human attention

Artificial selection

Selection tests

Husbandry also affects welfare
interaction with handlers and trainers an effect
Increased human contact can reduce stress

- in dogs in kennels (Sciverdecker et al 2013),
- during blood sampling (Hennessy et al 1998),
- in subsequent novel situations and meeting new people (Hennessy et al 2002; Bergamasco et al 2010)

- Improves obedience in working dogs (Lefebvre et al 2007, Haverbeke et al 2010)

Walking – exercise?

- Provides opportunities to
  - move, investigate and explore
  - social interaction

- Effect will depend on
  - on/off lead
  - duration
  - frequency
  - predictability (Meers et al 2004)
Increased lead walking

2 x 10 min  →  Decreased C/C
   to 60 min  More resting

6 x 10 min  →  No discernible difference
vs
1 x 60 min

Gaines 2006

Predictability and control

• Changing schedule causes stress

• Shutting in sleeping compartment
  • increased cortisol
  • increased barking  (p=0.005)
Make the kennel environment more interesting and comfortable using:
chew toys, or food filled Kongs™

3 studies

Kongs and bones were used significantly more than other toys

(\(F_{(11, 10)} = 0.22, p = 0.99\))
Dogs which used Kongs most suffered when their use was discontinued

Dogs which used Kongs experienced a decrease in stress when use was reintroduced

🌟 Long-term Kong provision

- Dogs value food-filled Kongs
  - Continue to use Kong even after 4 months
- No negative link to aggression, health, working ability
- Some individuals reduced self-mutilation
- Dogs become distressed if not provided at usual time

Gaines SA, Rooney NJ & Bradshaw JWS, Journal Forensic Science 53(6)
Conclusions

- Feeding enrichment can benefit individual dogs
- Use must be consistent and predictable as discontinuing enrichment can cause suffering
- Insufficient to produce an overall change in cortisol or behaviour
- What about long term solutions?

Can we design housing and husbandry systems which maximise welfare?

- Current designs are based on subjective opinions
- Budgets are limited
- We need to identify which features of the environment are most important to the dog
- Two studies
Which factors affect welfare the most?

- Contact with dogs
- Space allowance
- Predictability of routine
- Contact with people
- Noise
- Heating
- Habituation to a kennel
- Availability of environmental enrichment
- Exercise

Comparing welfare measures to aspects of housing and husbandry
Indicators of welfare status

- Behavioural indicators
- Physiological indicators

There isn’t a single measure of dog welfare

- No measure is 100% reliable
- Behaviour and physiology both valuable
- Reports and observations differ
- Dogs behave differently
  - at different times of day
  - when alone as compare to with people
Repetitive behaviour profile

- Spin
- Pace
- Bounce
- Circle

Categorisation of repetitive behaviour

- Carer outside kennel
- Carer walking past
- Dog and carer walking past x 2
- Food preparation
- Food delivery
- Barking playback
- Stranger outside kennel
- Stranger walking past
- No stimulation - lunch time
- No stimulation - evening

Denhman, Bradshaw & Rooney, (submitted)
Factors which may affect welfare

- predictability of routine
- location during cleaning
- total kennel area available
- heating
- temperature
- level of dog contact
- level of environmental stimulation
- noise disturbance
- level of interaction with care staff
- level of exercise

Measures of welfare

- Repetitive behaviours
- Activity
- Resting
- Physiology e.g. urinary cortisol
- Health e.g. diarrhoea

Frequency of repetitive behaviour

- No stimulation - evening
- No stimulation - lunch time
- Stranger walking past
- Stranger outside kennel
- Barking playback
- Food delivery
- Food preparation
- Dog and carer walking past x 2
- Carer walking past
- Carer outside kennel

93% of subjects

Most intense response
Common findings

- More exercise
  - (Rho=0.29, 0.74, p<0.06)
- Less barking
- Noisy kennels
  - (Rho=0.71, 0.76, p=0.03)
- More resting at quiet times

In smaller kennels:
- Increased size linked to increased resting
  - (Rho=0.74, p=0.02)

In bigger kennels:
- Resting was increased by
  - reduced noise levels
    - (Rho=0.63, p=0.10)
  - more interaction with care staff
    - (Rho= 0.38, p=0.009)

Critical factors vary dependent upon what is most limiting
Which factors affect welfare the most?

- Contact with dogs
- Space allowance
- Predictability of routine
- Contact with people
- Noise
- Heating
- Habituation to a kennel
- Availability of environmental enrichment
- Exercise

Housing is just half of the story

Dog is just half of the team
Interactions with handler affect welfare

- Survey of 364 pet dog owners

- Observations 53 pet dogs

Effects of training method on pet dogs
Dogs trained using more rewards
  • reported to be more obedient
  • learnt a new task better

Dogs trained using more punishment
  • reported to show more behaviour problems
  • interact less with new people
  • performed worse at a novel task
  • were less playful

Dog and handler work closely together
Handler’s personality

Attitude towards dogs

Behaviour towards dog

Success as a dog handler

Team performance

approach to training affected success

Handlers who believed in much punishment
  - less confident dogs

Patience

while performing a simple training task was predictive of ability

in two agencies
Practical advice and suggestions for improving welfare


Can we select dogs more likely to experience good welfare?

• Health
• Psychological health
Effects of pedigree dog breeding

Glaucoma in North America
5.52% - American Cocker
0.89% dog population
(Gelatt and MacKay 2004).

Cardiac problems in Cavalier King Charles Spaniels
25% of all conditions, prevalence of 17%
(The Kennel Club 2006)

11,000 Portuguese Water Dogs USA
1.5% have late-onset Addison's disease (Chase et al 2006)

Labrador Retrievers
Musculoskeletal 14% of dogs affected,
compared to 8% (UK Kennel Club 2004)
Exaggerated anatomical features

- short, flat faces
- folded or wrinkled skin
- bulging or sunken eyes
- long backs

p < 0.0001
Effects of altered anatomy on behaviour
RVC – all top 50 breeds affected

Asher, Diesel Summers, McGreevy, Collins (2009)
Working dogs - in environments including aversive and unexpected stimuli

Fear behaviours can simply reduce ability to perform the task
Fear also associated with

• Changes in immune function  
  (e.g. Terlouw et al 1997)

• Extreme social fear associated with reduced life span  (Dreschel 2010)

• Altered ability to learn new tasks  
  (e.g. Blackwell et al 2010)

• Frequent cause of aggression

• Cause compromised welfare

What factors influence this?

• Inherent characteristics of the dog

• Previous experience and learning opportunities

• Nature and circumstances of the stimulus
Reduce fearfulness

• Selection of breeding populations and puppies
  • Develop protocol for habituation of puppies
    best age?
    ideal exposure schedule?
    single puppies or groups?

Selection tests to identify best operational dogs?

Develop a protocol for “proofing” to fear–eliciting stimuli

Develop and validate treatment programmes

People have trouble recognising signs of fear

Can we improve recognition?

http://www.bris.ac.uk/vetscience/dogbehaviouralsigns/index.html

Facial expressions

• Lip licking
• Yawning
• Wrinkled muzzle
• Low ear positions
**Handler training is vital**

- Avoiding eye contact
- Repeated yawning
- Tense facial expression
- Whimpering / whining
- Tense body posture
- Rolling on back
- Ears held low
- Lifting one paw

**Selection of right handlers is paramount**

- be open-minded
- moderate behaviour in light of training
  - new knowledge
  - data collection
- understand dog behaviour
  - recognise and respond appropriately to fear and anxiety
Commonalities between agencies

- Dog welfare focus of public scrutiny
  - Proactive approach is important
- Financial viability is critical
- Value of dog considerably lower
  - Maximise performance
  - Reduce rejection rates
  - Education of carers is critical
- Collaborative research
  - Scientists and industry

Racing greyhounds
Life stages – factors affecting welfare and productivity

- Inbreeding
- Mating process
- Fear due to socialisation
- Long distance transport
- Reaction to kennelling
- Injury prone lines
- Predisposition to disease
- Diet
- Trainers’ approach and knowledge

Life stages – factors affecting stress levels and productivity

- Heating vs feeding costs
- Race frequency age start racing warm up and down
- Injury history
- Breeding line
- Exercise methods
- Track features kennelling duration
- Diet
New greyhound research

Reducing wastage
Increasing longevity

Periodontal disease

Effects of transport

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Thank you for your attention!

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