Animal Welfare Science and Bioethics Centre

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Collaborating Centre for Animal Welfare Science and Bioethical Analysis:
Founding Partner

http://animalwelfare.massey.ac.nz
Updating Animal Welfare Thinking:
Moving beyond the ‘Five Freedoms’ towards
‘A Life Worth Living

Professor David J Mellor
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Key Published Sources

Areas considered

• The animal welfare ‘Journey’
• Animal Welfare – an general overview (~ OIE)
• Science-based animal care began with problem-solving
• ‘Three Orientations’ towards animal welfare
• The ‘Five Freedoms’ – strengths and weaknesses
• The ‘Five Domains Model’ for animal welfare assessment
• Lives ‘Not Worth Living’, ‘Worth Avoiding’, ‘Worth Living’ and ‘Good Lives’
• Law changes from ‘Anticruelty’ to ‘Animal Protection’ to ‘Animal Welfare’
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• Current understanding of animal welfare: key features
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The animal welfare ‘Journey’

Steps to improve animal welfare can be seen as a journey:

- Different participants have reached different stages:
  - Some are close to the beginning
  - Some are at intermediate stages
  - Some have travelled a long distance
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  – Individual operators within specific groups
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- The route and speed of the journey varies, due to:
  - Socio-cultural imperatives, religious precepts, ethical issues
  - Economic constraints, the extent of political engagement
  - Historical & current views on the place of animals in society
  - What animal welfare is understood to mean
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The journey will never end – our learning will continue
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Animal Welfare – an general overview (~ OIE)

- Animal welfare means how an animal is coping with the conditions in which it lives.

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• An animal is in a good state of welfare IF IT IS well nourished, comfortable, healthy, safe and able to express innate behaviour; and IF IT IS NOT suffering from unpleasant states such as pain, fear, and distress.
Animal Welfare – an general overview (~ OIE)

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• An animal is in a good state of welfare IF IT IS well nourished, comfortable, healthy, safe and able to express innate behaviour; and IF IT IS NOT suffering from unpleasant states such as pain, fear, and distress.

• The TREATMENT animals receive is called animal care, animal husbandry or humane management.

• Good animal welfare requires disease prevention and veterinary treatment, appropriate shelter, management, nutrition, humane handling and humane slaughter/killing.
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- The animal welfare ‘Journey’
- Animal Welfare – an general overview (~ OIE)
- *Science-based animal care is based on problem solving*
- ‘Three Orientations’ towards animal welfare
- The ‘Five Freedoms’ – strengths and weaknesses
- The ‘Five Domains Model’ for animal welfare assessment
- Law changes from ‘Anticruelty’ to ‘Animal Protection’ to ‘Animal Welfare’
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Science-based animal care began with problem solving

• 80-100 years ago we really did not understand:
  – How to keep animals alive by meeting their basic survival needs
  – Nor how to keep them healthily productive
• Husbandry was mostly traditional, opinion-based, subjective
• Huge nutritional, environmental and health problems existed
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• Decades of problem-focused research made huge contributions
• Generally there were three linked aims:
  – Identify the problem
  – Understand the underlying body functions
  – Manipulate those body functions to solve the problem
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• Survival and healthy productivity were the aims, NOT improved animal welfare – welfare was not considered then
• BUT these advances did improve welfare incidentally
Science-based animal care began with problem solving

Examples of science-based animal care solutions

- **Nutrition:**
  - *Lifecycle changes in nutrient requirements were defined*
  - *Deficiencies and excesses can now be detected*
  - *Much improved nutritional management is the result*
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  – Ways of improving the ‘*genetic fit*’ were developed
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• **Physical environment:**
  – *Animal-environment (in)compatibilities* are better understood
  – Ways of improving the ‘genetic fit’ were developed

• **Health:**
  – At least 70 vaccines were developed for animals
  – Importance of *hygiene* was recognised – use of *antiseptics*
  – *Anaesthetics, analgesics, antibiotics, anthelmintics* developed
  – *Surgical techniques* were vastly improved.
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‘Three Orientations’ towards animal welfare

Biological functioning – the way the body works:
• Animal Welfare Science as a discipline began ~30 years ago
• It adopted the problem-solving ethos of the time
• It adopted the biological functioning approach of the time
• The measurable indices of welfare state were function focused
• There are dozens of such indices that are well validated and useful
‘Three Orientations’ towards animal welfare

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• There are dozens of such indices that are well validated and useful

• The primary focus was on identifying negative internal states and external circumstances
• ‘Good welfare’ meant that (farm) animals were:
  Stress free, healthy, reproducing well and productive
• BUT animals’ ‘experiences’ were not included or were avoided
• Then considered unscientific to study feelings, emotions or affects
‘Three Orientations’ towards animal welfare

Affective state – feelings/emotions/subjective experiences:
• Animals’ mental states became an increasingly legitimate focus
• Animals’ preferences, aversions and priorities were studied
• Animals’ motivation to behave in particular ways were studies
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• Animals’ mental states became an increasingly legitimate focus
• Animals’ preferences, aversions and priorities were studied
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• The measurable indices of welfare state were mainly behavioural
• Welfare was related mainly to animals’ mental states during their interactions with people, other animals and the environment
• ‘Good welfare’ meant:
  – Initially, that negative experiences were minimal
  – Later, that positive experiences were also included
‘Three Orientations’ towards animal welfare

Natural living – *ancestral or wild environments:*

- *Developed in parallel* with the other two orientations
- *A benchmark* for the (un)acceptability of intensive management

- ‘Good welfare’ meant that animals were kept in conditions that resembled their ancestral, wild or natural state
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Competing ‘schools of thought’
• David Fraser & colleagues identified these orientations in 1998
• Previously each was implicit – not explicitly defined
• AWS thinking now accepts that biological function and affective state are two interacting elements of the body operating as an integrated whole entity
• Natural living, cautiously employed, is still a useful benchmark
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The ‘*Five Freedoms*’ – strengths and weaknesses

<table>
<thead>
<tr>
<th>Freedoms</th>
<th>Provisions</th>
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<tbody>
<tr>
<td>1. Freedom <em>from</em> thirst, hunger and malnutrition</td>
<td>By providing ready access to fresh water and a diet to maintain full health and vigour</td>
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<td>2. Freedom <em>from</em> discomfort and exposure</td>
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<td>3. Freedom <em>from</em> pain, injury and disease</td>
<td>By prevention or rapid diagnosis and treatment</td>
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<td>4. Freedom <em>from</em> fear and distress</td>
<td>By ensuring conditions and treatment which avoid mental suffering</td>
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<td>5. Freedom <em>to</em> express normal behaviour</td>
<td>By providing sufficient space, proper facilities and the company of the animal’s own kind</td>
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The ‘Five Freedoms’ – strengths and weaknesses

Strengths:

- A paradigm for considering animal welfare and its management
- Widely adopted since 1993/94 because it:
  - Scoped the wider dimensions of animal welfare – subjective experiences, health status and behaviour
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  - Identified five targets for welfare improvement – the Freedoms
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• NOTE ALSO, the Five Freedoms drew attention to the need to understand, identify and minimise negative welfare states – the major focus of the last two decades of animal welfare research
• ALSO RECALL the problem-solving ethos – being free of problems
The ‘Five Freedoms’ – strengths and weaknesses

Weaknesses:

• Initially: ‘freedom from’ was to mean ‘as free as possible from’
• Subsequently: there has been a drift towards FF as absolute, complete or fundamental freedoms and even rights
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• Our current knowledge shows that such statements are conceptually and biologically inaccurate and misleading:
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  – THUS as principles they are unsound and illogical
  – AND they do not provide a convincing basis for animal welfare assessment and management
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  – AND they do not provide a convincing basis for animal welfare assessment and management
• ALSO, expressed as ‘freedom from’ they cannot be used to grade AW compromise
• The meaning of ‘degrees of impaired freedom’ is obscure and lacks utility
The ‘Five Freedoms’ – strengths and weaknesses

- THUS, the Freedoms are *problematic*
- BUT, the PROVISIONS are still *practically useful*

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Update on how animal welfare is currently understood

- It is a state within the animal – it is not animal care
- It relates to subjective experiences [feelings, emotions or affects]
- Brain structure/function must be sophisticated enough to support sentience and states of consciousness
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Examples of negative experiences now include [> FF list]:
  – Internally focussed: Breathlessness, thirst, hunger, pain, nausea, dizziness, debility, weakness and sickness
  – Externally focussed: Anxiety, fear, panic, frustration, anger, helplessness, loneliness, boredom and depression
The ‘Five Domains Model’ for animal welfare assessment

Key features of the Model:

• It is *NOT* a definition of animal welfare. It *is* a facilitatory device.
• *Systematic, structured* and *comprehensive* assessment of animal welfare
• Its first focus was on the *sources, types* and *grading of AW compromise*
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• *Sources:*
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• Sources:
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• Types:
  – Internal focus: Impeded breathing/breathlessness; dehydration/thirst; nutrient shortage/hunger; injury/pain; GI infection/nausea; other infections/sickness, weakness
  – External focus: Isolation/loneliness, depression; threat/anxiety, fear, panic; barren conditions/boredom, helplessness, frustration, anger
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• Grading:
  – A 5-tier compromise scale from A (none; very low) to E (very severe)
  Based on validated physical/functional and behavioural indices
The ‘Five Domains Model’ for animal welfare assessment – 2009

### PHYSICAL COMPONENTS

- **Domain 1: Nutrition**
  - Water deprivation, Food deprivation, Malnutrition

- **Domain 2: Environment**
  - Environmental Challenge

- **Domain 3: Health**
  - Disease, Injury, Functional Impairment

- **Domain 4: Behaviour**
  - Behavioural or Interactive restriction

### MENTAL COMPONENTS

- **Domain 5: Mental State**
  - Thirst, Hunger, Pain (short lived), Nausea, Fear
  - Debility, Weakness, Sickness, Pain (moderate), Dizziness, Breathlessness (Transient, curable)
  - Anxiety, Helplessness, Isolation, Boredom, Frustration, Distress, Pain (persistent, untreatable), Breathlessness (incurable)

### Animal Welfare Status
The ‘Five Domains Model’ for animal welfare assessment

Key features:

• The Model now *ALSO* includes assessment & grading of AW *enhancement*
The ‘Five Domains Model’ for animal welfare assessment

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• The Model now *ALSO* includes assessment & grading of AW enhancement
• This involves the same *systematic, structured* and *comprehensive* approach
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  – **Domain 3. Health:** Comfort of good health & high functional capacity; vitality of physical fitness
  – **Domain 4. Behaviour:** goal-directed exploration & foraging/hunting; affectionately bonded; maternally rewarded; excitedly playful; sexually gratified; calmness, in control; exercising choice
The ‘Five Domains Model’ for animal welfare assessment

Key features:

Grading enhancement:

• The grading of AW enhancement employs a 4-tier scale
• The scale [0, +, ++, +++] focuses on apparently rewarding behaviours
• Specifically, the animals’ use of opportunities to engage in such behaviours

The 2015 Five Domains Model

A poster is freely available
The Five Domains Model

**Physical/Functional Domains**

<table>
<thead>
<tr>
<th>Survival-Related Factors</th>
<th>Situation-Related Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1: Nutrition</strong></td>
<td><strong>4: Behaviour</strong></td>
</tr>
<tr>
<td>Restrictions on:</td>
<td>Exercise of ‘agency’ imposed by:</td>
</tr>
<tr>
<td>Water intake</td>
<td>Invariant, barren environment</td>
</tr>
<tr>
<td>Food intake</td>
<td>(ambient, physical, biological)</td>
</tr>
<tr>
<td>Food quality</td>
<td>Inescapable sensory impositions</td>
</tr>
<tr>
<td>Food variety</td>
<td>Choices markedly restricted</td>
</tr>
<tr>
<td>Voluntary overfeeding</td>
<td>Constraints on environment</td>
</tr>
<tr>
<td>Force feeding</td>
<td>Focused activity</td>
</tr>
<tr>
<td>Eaten correct quantities</td>
<td>Constraints on animal to</td>
</tr>
<tr>
<td></td>
<td>animal interactive activity</td>
</tr>
<tr>
<td></td>
<td>Limits on threat avoidance;</td>
</tr>
<tr>
<td></td>
<td>escape or defensive activity</td>
</tr>
<tr>
<td></td>
<td>Limitations on sleep/activity</td>
</tr>
<tr>
<td>Unpredictable events</td>
<td></td>
</tr>
</tbody>
</table>

**Unavoidable/imposed conditions**

| Thermal extremes        |
| Unavailable/substrate   |
| Close confinement       |
| Atmospheric pollutants: CO₂, ammonia, dust, smoke |
| Unpleasant/stong odours |
| Light inappropriate intensity |
| Loud/thunder: unpleasant noise |
| Environmental monotony: ambient, physical, lighting |
| Unpredictable events    |

| Thermal tolerated       |
| Suitable substrate     |
| Space for free movement |
| Fresh air               |
| Pleasant/tolerable odours |
| Light intensity tolerable |
| Noise exposure acceptable |
| Normal environmental variability |

**Presence of:**

| Disease: acute, chronic |
| Injury: acute, chronic |
| Multiple/morbidities    |
| Functional impairment:  |
| due to limb amputation; |
| or limb, heart, vascular, |
| kidney, neural or other |
| problems                |
| Poisoning               |
| Obese/off.cntr         |
| Poor physical fitness: |
| muscle condition        |

**Little or no:**

<table>
<thead>
<tr>
<th>Disease</th>
<th>Injury</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Affective Experience Domain**

<table>
<thead>
<tr>
<th>5: Mental State</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Negative</strong></td>
</tr>
<tr>
<td>Thirst</td>
</tr>
<tr>
<td>Hunger (general)</td>
</tr>
<tr>
<td>Hunger (satiety)</td>
</tr>
<tr>
<td>Malnutrition</td>
</tr>
<tr>
<td>Dehydration</td>
</tr>
<tr>
<td>Bowel pain</td>
</tr>
</tbody>
</table>

| Forms of discomfort: |
| Thermal: dulling, overheating |
| Physical: joint pain, skin irritation |
| Physical: stiffness, muscle tension |
| Respiratory: e.g. breathlessness |
| Auditory: impairment, pain |
| Visual: glassy/darkness eye strain |

| Forms of comfort: |
| Thermal: calming |
| Physical: soothing |
| Respiratory: relaxation |
| Auditory: auditory comfort |
| Visual: clarity |

**Negative**

| Breathlessness     |
| Pain: many types   |
| Disability: weakness |
| Sickness: malaise  |
| Nausea:             |
| Tension:           |
| Physical exhaustion |

**Positive**

| Comfort of good health and high functional capacity |
| Anger, frustration |
| Boredom, helplessness |
| Loneliness, isolation |
| Depression |
| Sexual frustration |
| Anxiety, fearfulness, panic, anger |
| Neuroplasia |
| Exhaustion |

**Welfare Status**

| Calmness |
| Engaged, in control |
| Affectionate sociability |
| Maternally rewarded |
| Exclusion/gratification |
| Sexual gratification |
| Secure/protected/confident |
| Likes novelty |
| Energised-refreshed |
The ‘Five Domains Model’ for animal welfare assessment

Key features:

Grading enhancement:

- The grading of AW enhancement employs a 4-tier scale
- The scale [0, +, ++, +++] focuses on apparently rewarding behaviours
- Specifically, the animals’ use of opportunities to engage in such behaviours

Quality of Life:

- Refers to the balance between negative and positive experiences
- THUS, the Model can facilitate Quality of Life evaluations
Areas considered

- The animal welfare ‘Journey’
- Animal Welfare – an general overview (~ OIE)
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Quality of Life – *the balance between negative and positive affects*:

- *Notional Quality of Life Scale*

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A good life</td>
<td><em>Balance is strongly positive:</em> full compliance with best practice recommendations well above minimum standards</td>
</tr>
<tr>
<td>A life worth living</td>
<td><em>Balance is positive, but less so:</em> full compliance with minimum standards that <em>include significant enrichments</em></td>
</tr>
<tr>
<td>Point of balance</td>
<td><em>Neutral positive-negative affective balance</em></td>
</tr>
<tr>
<td>A life worth avoiding</td>
<td><em>Balance is negative:</em> can be remedied rapidly by veterinary treatment or change in husbandry practice</td>
</tr>
<tr>
<td>A life not worth living</td>
<td><em>Balance is strongly negative:</em> cannot be remedies rapidly so that euthanasia is the only humane alternative</td>
</tr>
</tbody>
</table>

Making QoL assessment is difficult:

Nevertheless, this scale acknowledges that:

• *Animal care* should be directed at *more than mere survival*
• Rather, it should aim at animals *thriving*
• *Animals can* and, given the opportunity, *do have positive experiences*
• An *overall positive balance* is possible and *should be mandatory*
• *Minimum code standards* should therefore be reviewed and *should aim to include validated enrichments*

Questions that may assist this process [FAWC 2009; Green & Mellor 2011]:

• **Overall**: What opportunities are provided for the animals’ comfort, pleasure, interest and confidence?

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• **More specifically:**
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  – How will expressions of normal behaviour be encouraged and harmless wants met?

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• **More specifically**:
  – What provisions have been made to ensure that eating the food provided will be an enjoyable experience?
  – How will expressions of normal behaviour be encouraged and harmless wants met?
  – What environmental choices will be available that will encourage exploratory and food acquisition activities which are rewarding?
  – What provisions have been made to enable social species to engage in bonding and bond affirming activities, and, as appropriate, other affiliative interactions such as maternal, paternal or group care of young, play behaviour and sexual activity?
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Law changes from ‘Anticruelty’ to ‘Animal Protection’ to ‘Animal Welfare’

First – Anticruelty Acts:

• Aim to prevent & punish the worst treatment of animal by people
  – What IS done TO animals – ABUSE
  – What is NOT done FOR animals – NEGLECT
  – Focus: the WORST FORMS of human behaviour towards animals
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  – They retain anticruelty provisions
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  – *Ill treatment* is less severe than *cruelty*, *but is still unacceptable*
  – Focus: a much *wider range of BAD human behaviour* towards animals

Third – Animal Welfare Acts:
• Retain the previous largely *REACTIVE* provisions
• AND focus heavily on ‘a *duty of care*’ which is *PROACTIVE*
• Potentially cover the *FULL RANGE* of behaviours – *BAD-to-GOOD*
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Key positive features of incremental improvement:

- Practically realistic
- Step-wise progression – ultimately to the gold standard
- Reachable targets
- Each small improvement is warmly acknowledged
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Minimising the negatives:

- ‘Lip-service’ commitments may hide inaction
  - Minimum standards are outlined in welfare codes
  - It is unprofessional for vets and other specialists
  - Also, it is personally unethical
Animal welfare change management by ‘Incremental Improvement’

The absolute gold standard approach:
- Commonly adopted by extreme animal advocates
- Unequivocal commitment to how things ‘ought’ to be
- The best possible standards are defined
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- Unreachable immediately
- No concessions to practical, financial or other hindrances
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BUT incremental improvement TOWARDS a gold standard WORKS
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Current understanding of animal welfare:

Key features

For full details
see Section 10


[This is an open access, free download journal]
Current understanding of animal welfare: Key features

For full details see Section 10

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• Animal welfare:
  – Is a subjective state that is experienced by the animal
  – Subjective states of welfare significance are negative or positive
  – To experience them the animal must be conscious
Current understanding of animal welfare: Key features

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• Animal welfare:
  – Is a subjective state that is experienced by the animal
  – Subjective states of welfare significance are negative or positive
  – To experience them the animal must be conscious

• Generation of subjective experiences:
  – There are two main types:
    (1) Those due to internal disturbances or imbalances within the body
        Negative-to-neutral range:
        e.g. breathlessness, thirst, hunger, pain, nausea, weakness, sickness
    (2) Those related to the animal’s perception of its external circumstances
        Negative-to-neutral: e.g. anxiety, fear, boredom, loneliness, frustration
        Neutral-to-positive: e.g. comfort, pleasure, interest, confidence, control
Current understanding of animal welfare: Key features

- **Key animal care strategies:**
  - Implement the *Five Provisions* in order to:
    - Minimise *internally generated negative experiences*
    - Minimise *externally generated negative experiences* AND/OR
      *Replace* them with *positive experiences*
  - Monitor the welfare state using *well-validated* functional and behavioural indicators
Current understanding of animal welfare: Key features

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  - Monitor the welfare state using *well-validated* functional and behavioural indicators

- **Properly train animal care staff** to ensure that they possess:
  - Good *welfare-related* knowledge, skills and attitudes towards animals
  - Behave *empathetically* and, as appropriate, bond with the animals
  - The ability to recognise when welfare problems arise
  - The ability to implement remedies when required, if necessary with advice.
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Conclusions

• There is a clear need to *update the characterisation of animal welfare* to accommodate recent developments in understanding

• *Animal care needs to aim higher than mere survival* via negative-to-neutral nutritional, environmental and health management

• *Acceptable animal welfare management* should focus on BOTH the minimisation to negative experiences and the provision of opportunities to have positive experiences

• *Minimum code standards* should include greater provision for validated enrichments – this is beginning to happen

• My purpose here has been to *stimulate discussion and action*
A reminder of the areas considered

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Updating Animal Welfare Thinking:
Moving beyond the 'Five Freedoms'
towards 'A Life Worth Living'

Mellor, DJ