

## “The Virtuous Bicycle” A delivery vehicle for Welfare Quality



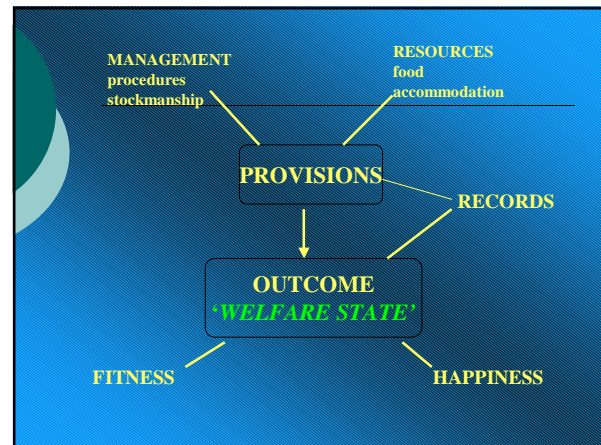
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NFACC Conference, Ottawa  
2007

## Welfare Quality: Part 1. Action for farm animals

- Promotion of animal wellbeing (“fit and happy”) through:
  - Evidence of good husbandry
  - Monitoring of welfare
  - Effective action to address welfare problems
  - Review of actions
  - Rewards for good husbandry

## GOOD HUSBANDRY

- provision of appropriate resources
- skilled and sympathetic stockmanship
- clear records of planning, actions and effects

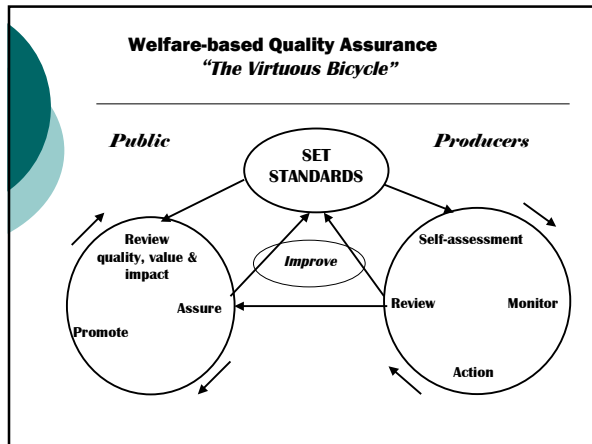


## Quantifying welfare state on farm

- Farmers are responsible for husbandry provisions but ‘Welfare Assurance’ requires animal-based measures of outcomes
  - quantifiable, repeatable & robust
  - should integrate consequences of past husbandry

## Quality control: The Producer Cycle

- Self-assessment
  - evidence of resources and records (e.g. health)
  - welfare concerns and priorities for action
- Independent monitoring
  - animal-based protocols for assessment of outcomes
- Action plan
  - Prioritised to address major concerns
- Review
  - Compliance and non-compliance, benchmarking
  - Reassess priorities for action and subsequent review



- ### Freedoms and Provisions
- **Freedom from hunger and thirst:**
    - access to fresh water and a diet to maintain full health and vigour
  - **Freedom from discomfort:**
    - a suitable environment: .e.g. shelter and a comfortable resting place
  - **Freedom from pain, injury and disease:**
    - prevention and/or rapid diagnosis and treatment
  - **Freedom from fear and stress:**
    - ensure conditions which avoid mental suffering
  - **Freedom to express normal behaviour:**
    - ensure sufficient space, proper facilities and social contact

### Welfare Quality: 12 welfare criteria

Welfare principles	Welfare criteria
Good feeding	Absence of prolonged hunger
	Absence of prolonged thirst
Good housing	Comfort around resting
	Thermal comfort
	Ease of movement
Good health	Absence of injuries
	Absence of disease
	Absence of pain induced by management procedures
Appropriate behaviour <sup>3</sup>	Expression of social behaviours
	Expression of other behaviours
	Good human-animal relationship
	Absence of general fear

- ### Monitoring protocols
- Bristol protocols for assessment of Freedom Food Scheme
    - Becky Whay, David Main, Laura Green, John Webster
  - Dairy cows
  - Free-range hens

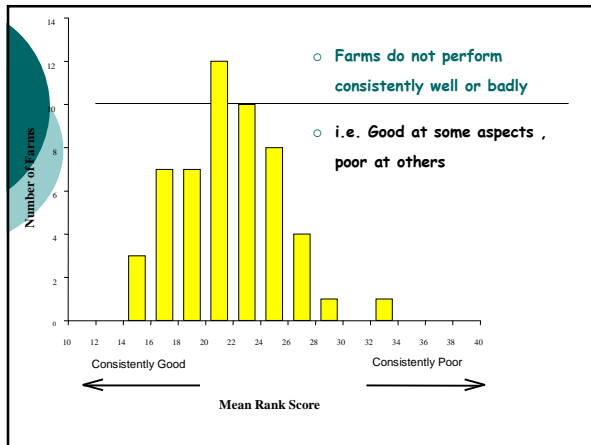
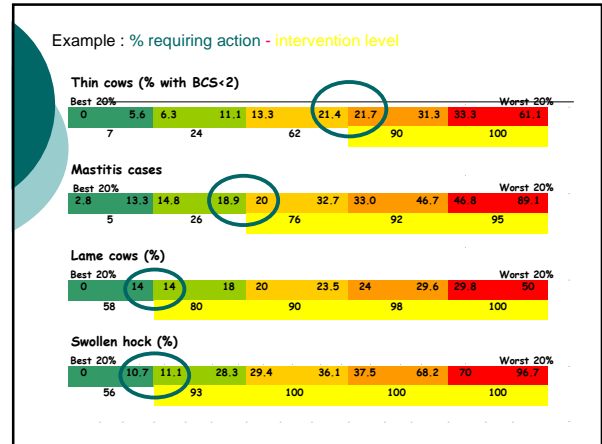
- ### Monitoring: dairy cows Freedom Food v. NDFAS
- Nutrition
    - condition, digestion
  - Fertility
  - Mastitis
  - Lameness
  - External appearance
  - Behaviour
    - resting, social

### Results Profile of 53 Dairy Farms

Measure	Source of Information	Unit of Measure	Score Categories (20% in each banding)									
			A	B	C	D	E					
<b>Health &amp; Production</b>												
<i>Nutrition</i>												
Annual Ave. milk yield	Est.	Litres	10360	8300	8200	7789	7652	7118	7000	6500	6313	4275
Thin cows (BCS <2)	Obs.	%	0	3.6	6.3	11.1	13.3	21.4	21.7	31.3	33.3	64.1
Fat cows (BCS >3.5)	Obs.	%	0	0	0	0	0	1.4	5	5.1	25.6	
Bloated rumen <sup>1</sup>	Obs.	%	0	0	2.6	6.5	6.7	16.7	17.5	24.1	25	46.7
Hollow rumen <sup>1</sup>	Obs.	%	0	6.3	7.4	13.8	14.3	20	20.8	31.3	32.1	82.4
Milk fever cases	Est.	/100 cows/year	0	0	0	0	0	1.1	1.1	1.3	30.6	
Other disease <sup>2</sup>	Est.	/100 cows/year	0	2.7	3.0	4.4	4.7	6.9	7.3	9.5	10.3	19.1
<i>Reproduction</i>												
Conception rate to 1 <sup>st</sup> Service	Est.	%	80	68	66	60	59	56	55	49	47	28
Assisted calving cases	Est.	/100 cows/year	0	0	0	0	0.9	1.1	1.1	4.8	4.9	46
<i>Mastitis</i>												
Mastitis cases	Rec.	/100 cows/year	0	9	11.5	20.7	21.3	34.5	40.8	46.2	46.8	120
Mastitis cases	Est.	/100 cows/year	2.8	13.3	14.8	18.9	20	32.7	33.0	46.7	46.8	89.1
<i>Lameness</i>												
No. of lame cows	Obs.	%	0	13.6	13.8	18	19.5	23.5	23.6	29.6	29.8	50
Lameness cases	Rec.	/100 cows/year	0	0	0	2.2	4.1	4.3	11.0	11.5	42.3	
Lameness cases	Est.	/100 cows/year	3.2	8.7	9.2	14.7	14.9	20.7	21.3	34.8	34.9	54.4
Claw overgrowth <sup>3</sup>	Obs.	%	0	11.8	12.5	25	26.7	34.4	35	46.2	46.4	76.5
Poor claw conformation <sup>4</sup>	Obs.	%	0	0	0	0	3.3	7.1	7.4	16.7	17.9	37.3
<i>Non-specific Illness / Mortality</i>												
Dull / Obviously sick	Obs.	%	0	0	0	0	2.2	3.3	3.6	6.3	6.7	20
Sudden death / casualty	Est.	/100 cows/year	0	1.0	1.1	1.7	1.8	2.8	3.1	4.1	4.1	15.6

External Appearance		Cow Cleanliness & Coat Condition <sup>5</sup>									
Dirty hind limbs	Obs. %	95	85	90	96.4	96.7	100	100	100	100	100
Dirty udder	Obs. %	0	8.3	10	17.7	17.9	23.8	24.1	33.3	35.9	76
Dirty flanks	Obs. %	0	0	2.5	6.9	8.3	11.8	14.3	25	25.6	77.8
Dull coat	Obs. %	0	0	2.5	5.6	6.7	7.4	7.7	12.5	16.7	36.6
Thick hairy coat	Obs. %	0	5	5.9	10.3	11.1	16.7	18.2	23.3	25	76.9
Hair loss	Obs. %	0	0	4.2	7.1	7.7	13.8	14.8	30.8	32.6	88.2
Injuries from the Environment											
Hock hair loss	Obs. %	0	7.7	10	21.9	22.2	45.5	47.1	71.4	74.1	91.7
Swollen hock	Obs. %	0	10.7	11.1	28.3	29.4	36.1	37.5	68.2	70	96.7
Ulcerated hock	Obs. %	0	0	2.8	3.7	4.8	11.8	12.5	25	28.6	50
Non-hock injuries	Obs. %	6.3	22.9	45.8	58.6	59.3	65.6	66.7	79.2	80	100
Behaviour											
Approachability <sup>4</sup>											
Maximum flight distance	Obs. meters	3.5	2.5	3.0	3.0	3.5	4.0	4.5	4.5	5	7
Average flight distance	Obs. meters	0.6	1.1	1.2	1.5	1.5	1.65	1.7	1.9	2.1	3.4
Lying Behaviour											
Cow idling <sup>7</sup>	Obs. %	0.0	2.6	2.8	3.7	4.7	5.1	5.6	8.3	8.5	25
Rising restriction <sup>8</sup>	Obs. %	0	0	12.5	20	20	30	33.3	40	50	77.8

<sup>1</sup> Bleated / Hollow Rumen - Proportion of cows with noticeable signs of rumen distention or low rumen fill  
<sup>2</sup> Other Disease - Including hypomagn, ketosis, etc. but not mastitis, lameness and milk fever  
<sup>3</sup> Claw Overgrowth - Proportion of cows with long toes / excessive heel depth / imbalance between claws  
<sup>4</sup> Claw Conformation - Proportion of cows with any abnormalities of conformation such as corkscrew claws / flexor tendon extension  
<sup>5</sup> Cow Cleanliness / Coat Condition / Injuries - Proportion of cows with signs of each condition  
<sup>6</sup> Approachability / Flight Distance - Average & maximum distance at which 10 cows retreat from observer  
<sup>7</sup> Cow Idling - Proportion of cows observed performing no activity (not eating, drinking, ruminating, walking or lying)  
<sup>8</sup> Rising Restriction - Proportion of group showing serious / severe rising restriction (difficulty rising, hitting fittings & 'log sitting')



- ### Assessment of dairy cow husbandry and welfare: Conclusions
- Husbandry can be self-assessed from provisions
  - Welfare can only be assessed from outcomes
  - Good agreement among experts as to importance of problems and need for intervention
  - Robust, quantifiable, integrative measurements can be made in one day (repeated as necessary)

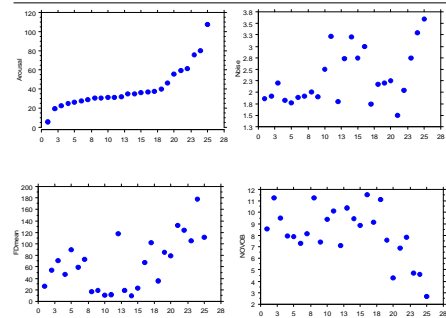
- ### Monitoring: Free range hens RSPCA "Freedom Food"
- Animal-based protocol for assessment of welfare of free-range hens - (RSPCA Freedom Foods)
  - Explore associations between measures of attitude, activity and physical welfare
  - Explore impact of building design and husbandry practices

- ### Procedures
- Farms: 25 RSPCA 'Freedom Food' accredited
  - Observers: five
  - Visits: @ 18, 36, 52 and 70 weeks of age
  - Locations:
    - A. Nest house (perforated floor)
    - B. Littered area
    - C. Range

## Hens: animal-based measures

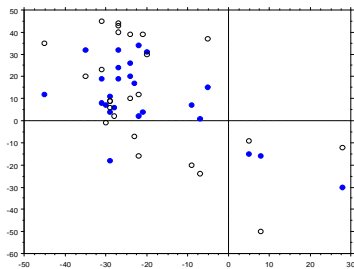
Attitude	Activity	Physical Welfare
Arousal	Feather pecking	Feather loss
Flight distance	Aggression	Body condition
Novel object	Use of range	Mortality
Noise	(Pariahs)	Comb colour (Injuries)

## Attitude: arousal, noise, FD, NOVOB



## Arousal and Mood:

x = calm - aroused, y = confident - anxious, blue = NOVOB, open = FD



## Aggression, feather pecking & feather loss

Measure	Aggression	Feather peck	Feather loss
Nest house	0.20*	3.51	3.66
Litter	0.43	4.55	3.44
Range	0.44	2.57	2.40
Age, 36w	0.18*	3.95	0.71*
52w	0.36*	3.76	2.41*
70w	0.86*	3.16	4.02*

## Correlations between attitude, activity and physical welfare

	Arousal	Aggression	F-peck
Aggression	0.35		n.s.
F-peck	0.42	n.s.	
F-loss (total)	0.58	0.58	n.s.
F-loss (severe)	0.68	0.53	n.s.
Mortality	0.29	n.s.	0.26

## Conclusions: Part 1

- WAFL Protocol robust
  - no significant between observer variation
- Welfare on most farms was satisfactory
  - 22 'calm', 3 'anxious'
- 'Attitude' best assessed by Arousal and NOVOB
- Arousal, aggression but not F-peck increased with time
- 'F-peck' related to arousal but not aggression or F-loss!
- 'High anxiety' flocks show reduced physical welfare

## Part 2: Effects of housing and husbandry -Farm questionnaire

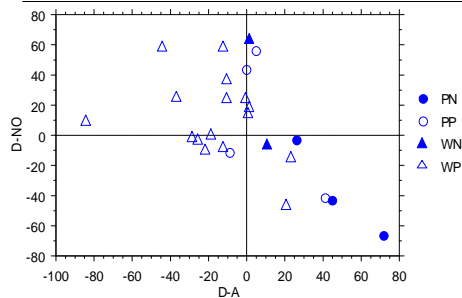
- Resources
  - Strain of hen
  - House design, age
  - Floor, litter, nest box, perches, feeders, drinkers
  - Flock size, stocking density
- Health and performance
  - Mortality: Range 1.8 -21.4, median 6.9
  - Infections, infestations: all v. low

## Effects of fixed resources (ANOVAR)

	Mortality	F-loss	Arousal	NOVOB
Floor	n.s.	*	**	**
Perches	n.s.	(*)	**	n.s.
Feeder	n.s.	n.s.	n.s.	n.s.
Drinker	n.s.	n.s.	n.s.	n.s.

## Effects of perches and floor type on attitude

△ =PW, ▲ = NPW, ○ = PPI, ● = NPPI.



## Effects of housing and husbandry: conclusions

- Flock size (3,000-16,000)
  - ↗ size, ↘ arousal, ↗ NOVOB
- Stocking density (9.0-12.3 /sq.m)
  - ↗ SD, ↘ arousal, ↘ feather loss
- Resources
  - feeders, drinkers, nest box all n.s.
- Perches and floor type (wood or wire v. plastic)
  - NP,PI ↗ arousal, (aggression), feather loss, range use

## Laying hen protocol: conclusions

- We have a robust protocol suitable for on-farm use
- Welfare on most FF free-range units was generally satisfactory
- We have observed consistent links between 'fit' and 'happy'
- We have a chief suspect for observed welfare problems but, as yet, no motive.

## Quality Control: Action and Review

- Currently most UK welfare assurance schemes are having little significant effect on welfare quality (annual 'chores')
- In Bristol 'Lameness Control Plan' no overall effect of intervention, but when proximate risks were reduced lameness was reduced
- Farmer compliance requires time and reward
- Farmers cannot do everything at once

### Quality control: The Producer Cycle 2.

- Self-assessment (of resources)
  - Saves time, bureaucracy
  - Farmer knows most (if not best)
- Independent monitoring (of welfare outcomes)
  - proven robust methods
  - can concentrate on major issues (need not always be exhaustive-saves time)
- Action plan
  - Compliance depends on perceived reward to farmer
- Reassessment
  - benchmarking provides incentives for improvement
  - Non-compliance results from failure to take effective action

### Interpretation and integration of welfare assessments

- To achieve effective action by farmer
- To meet standards of QA Scheme
- To promote QA Scheme to consumers

### Welfare Quality: Progressive evaluation structure

