Reducing feather pecking in commercial UK flocks

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Feather Pecking

- Occurs in all systems
- Harder to control in non-cage systems
- Different forms – GFP, SFP, VP
- Highly prevalent
- Influenced by genetics and environment – UK experience may only partially translate.

Small experiments to Farm solutions

- Initial experiments – discover underlying causes of FP (rear and lay)
- Epidemiology – quantify risk factors for FP on commercial farms
- Evaluate - devise possible preventive strategies for farms
- Implement – how to get real change on farms

Step 1: Discover underlying causes

- Litter deprivation at any age
- GFP – a form of social exploration
- SFP – inadequate diet (protein, fibre, minerals), limited foraging opportunities
- Change to a less-preferred diet
- Active and inactive birds together

Step 2: Quantify risk factors (i) cross-sectional, case-control

e.g. Green et al., 2000; Vet Record
Bestman et al., 2009; Appl. Anim. Behav. Sci

- Commercial farms at rear
  - Lack of perches
  - Degree of change experienced at transfer to laying facility
  - Unsuitable substrates, or periods without substrate
  - Stocking density
- Commercial farms at lay
  - Poor range use
  - Diet change
  - Bell drinkers
  - Lights in nest boxes

Step 2: Quantify risk factors (ii) Prospective studies

e.g. Drake et al., 2010 Br. Poult. Sci
Lambton et al., 2010; Vet. Rec.

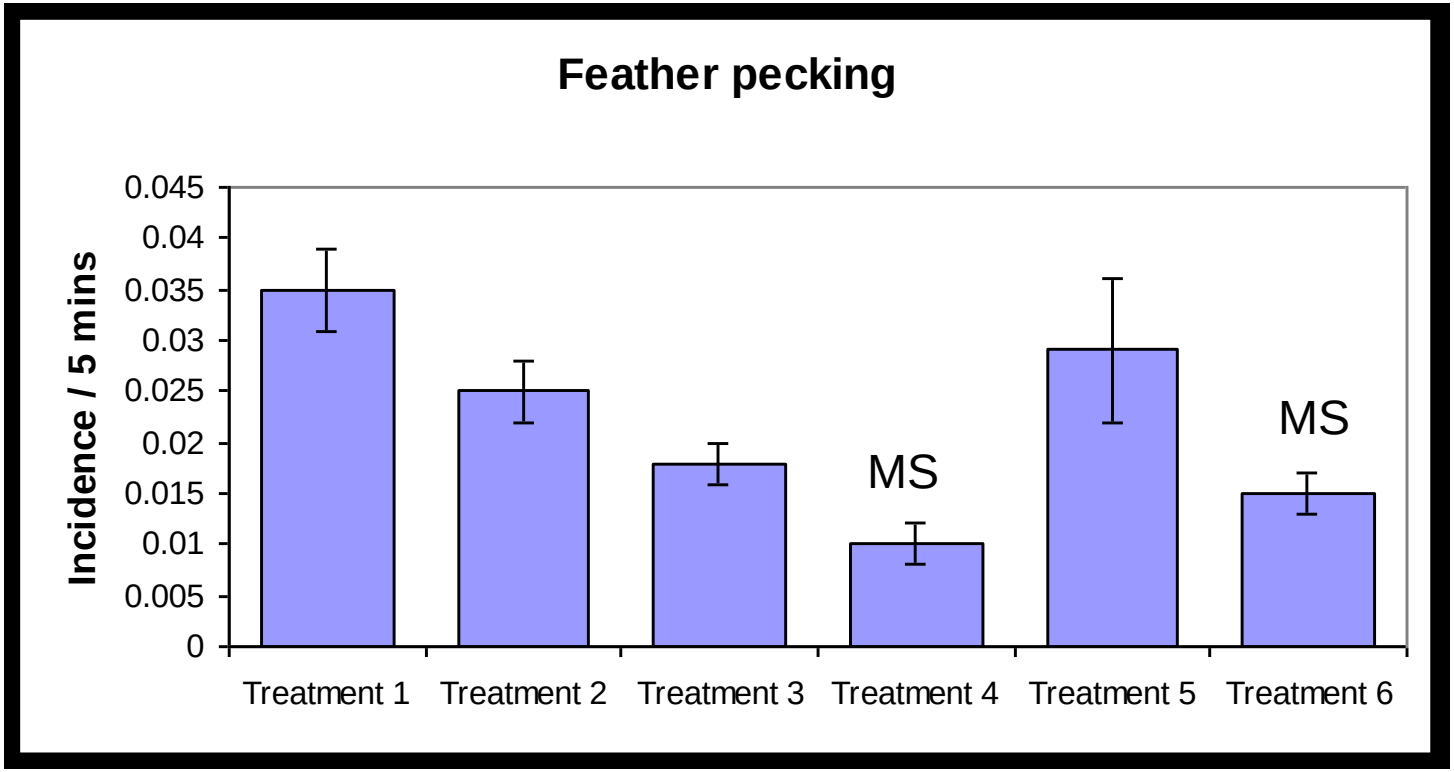
- Follow birds over time – increased study power
- Rearing
  - Bell drinkers
  - Reduced foraging
  - More than 2 diet changes
- Laying
  - Poor range use
  - Feeding pellets
  - Initial confinement on slats

Step 3. Evaluate potential strategies
(farm-scale experiments)

e.g. Nicol et al., 2006; Br. Poult. Sci

- 36 barn (single-tier aviary) flocks
- Six different treatments, flock size, stocking density
- Two of these treatments (12 flocks) tested potential management strategies suggested by previous studies:
  - Nipple drinkers instead of bell drinkers *
  - No lights in nest boxes *
  - Increased litter management regime

Feather pecking was reduced by use of these management strategies



Step 3. Evaluate potential strategies

(by use of management strategies)

Lambton et al., 2013 Vet Rec

Reviewed 330 studies in 2008

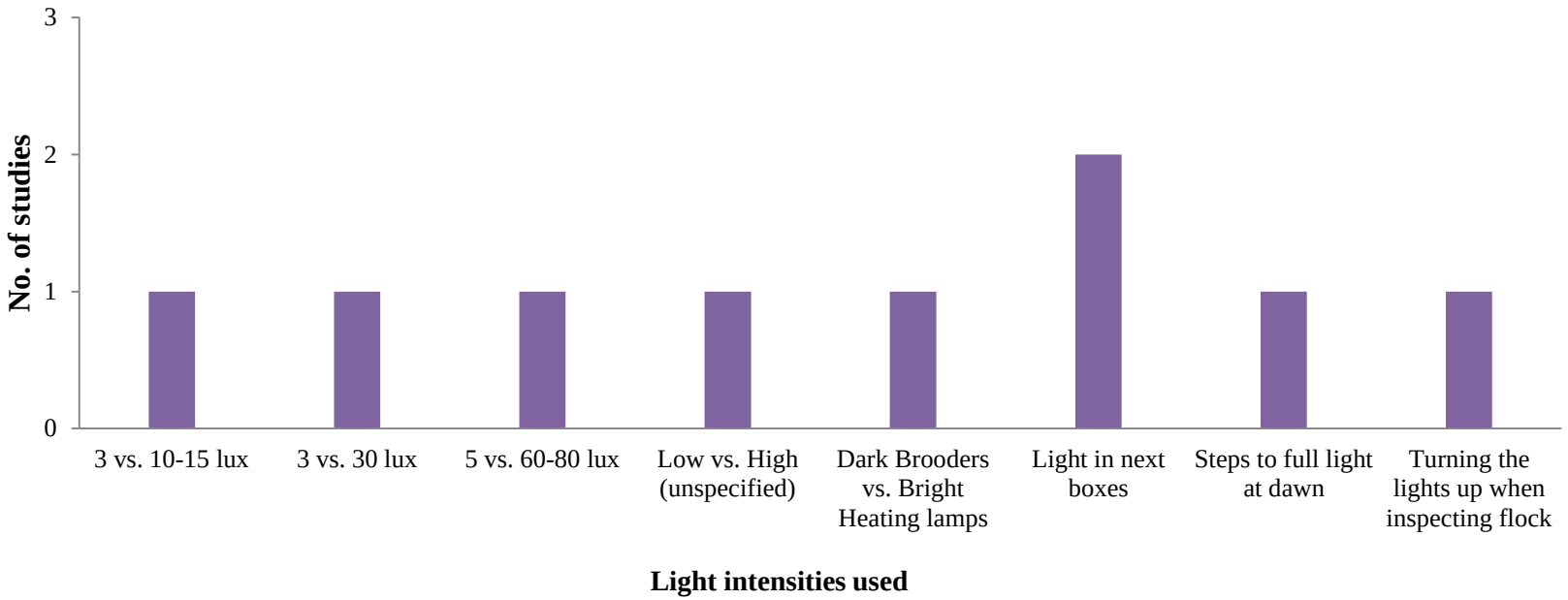
Search terms ‘injurious pecking’, ‘feather pecking, ‘vent pecking’, ‘cannibalism’

Original papers, conference proceedings and PhD theses

Most papers on genetics (37), diet deficiency (20), housing system (19), litter provision (18), light (9)

No formal synthesis of results

- **Variation in Experimental Design**
  - **Manipulation of light**



Semi-formal review

- Sources scored from 1 (low) to 5 (high) for our purposes
  - Correct experimental design and statistical analysis
  - UK relevance
  - Study done under commercial conditions
  - Recency
  - Focus on more severe types of FP

- Initial list of risk factors most applicable to UK commercial farms produced
- Of these, 44 factors that could be *manipulated* formed the basis of new management strategies

Development of management strategies

- Potential management strategies discussed with stakeholders (industry, NGOs, government, retailers and poultry vets) for feasibility
- Cost-benefit analysis – economist input

Risk factor = poor litter quality

How can litter quality be improved?

Sometimes litter is damp

Suggest use of highly absorbent wood pellets in damp patches

How much will this cost?

Improve litter condition

Example strategies

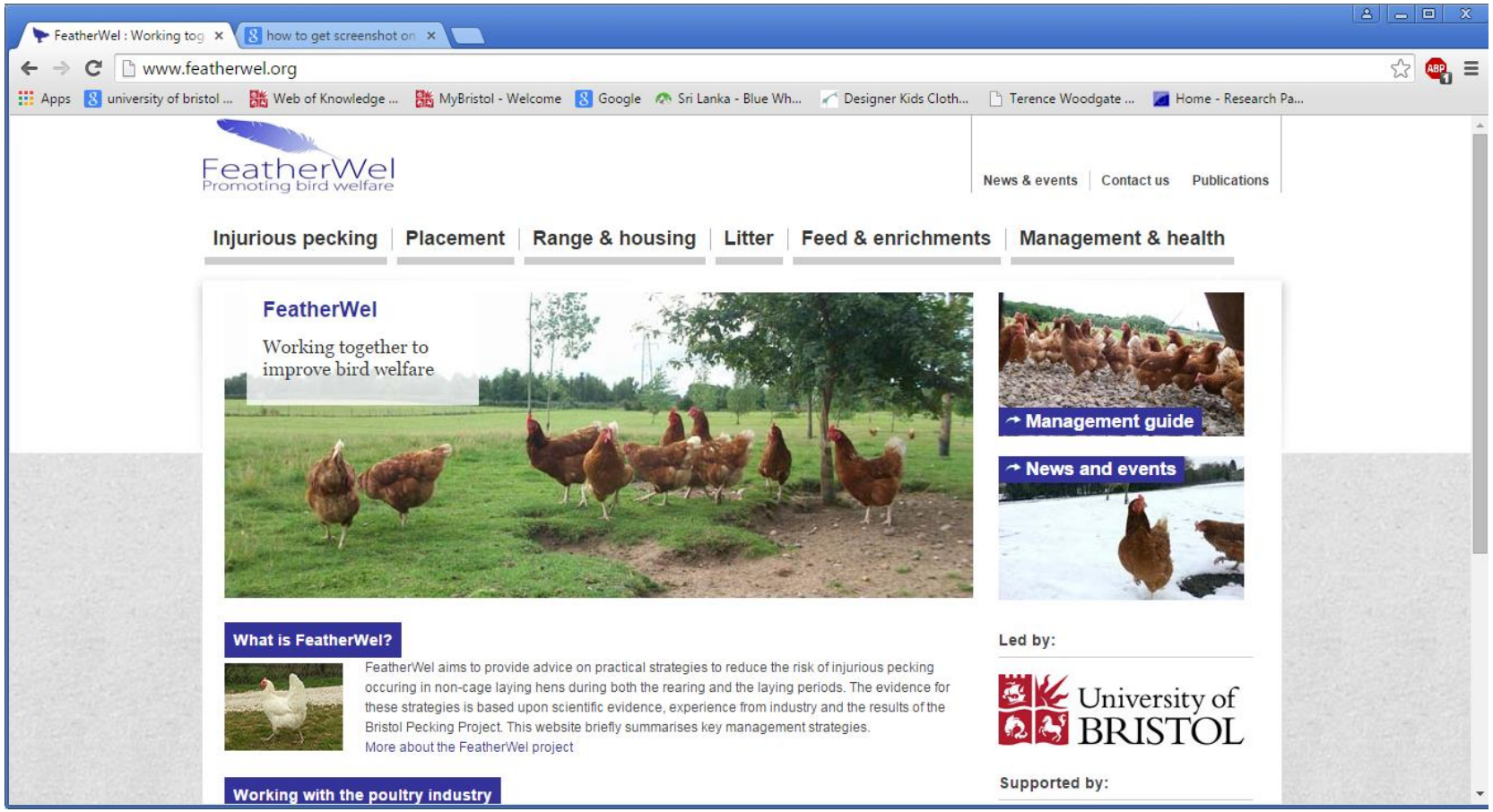
Pecking blocks

Developed by us

Vencomatic Group
Agro Supply – Prinzen – Vencomatic

Promote range use

www.featherwel.org



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Testing the management strategies

Lambton et al., 2013 Vet Rec

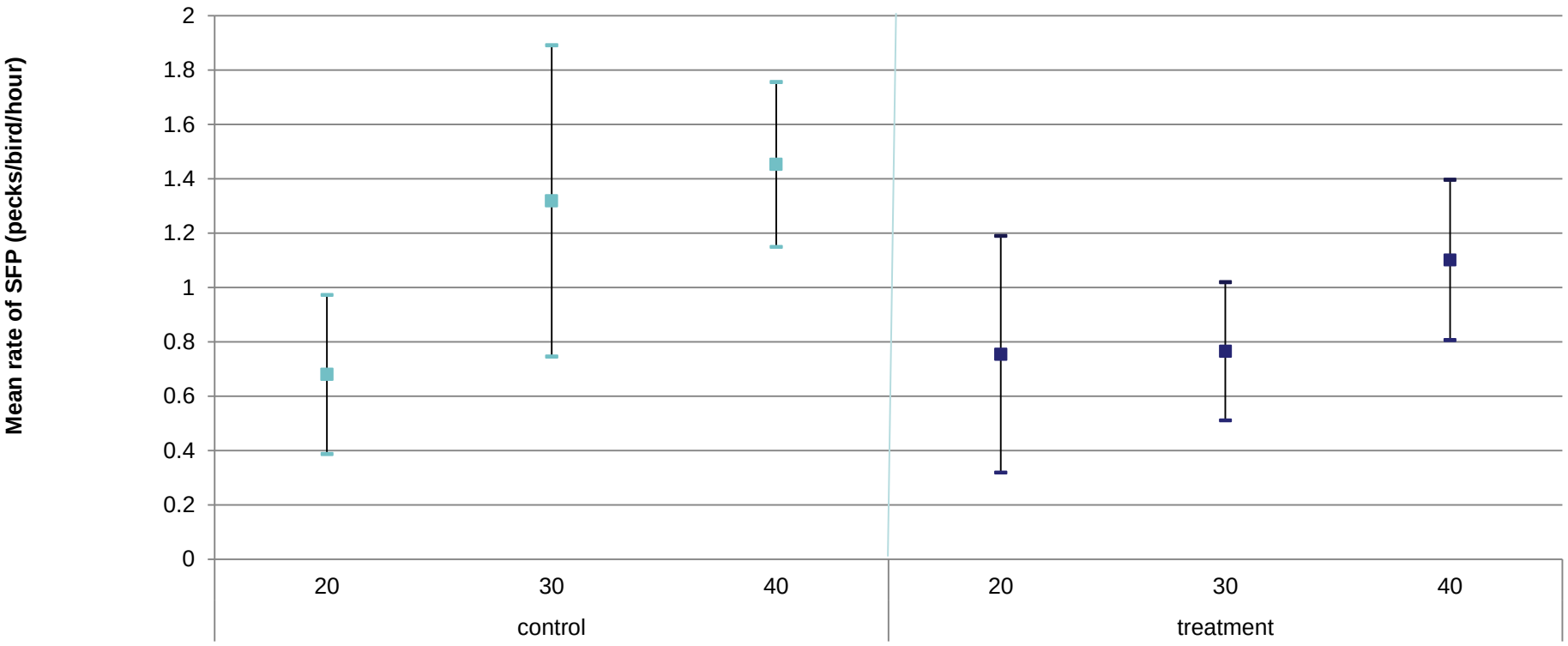
- 100 commercial free-range farms enrolled
- 53 Intervention (Treatment) and 47 Control Flocks
- Visited previous flocks towards end of lay.
- ‘Bespoke’ management strategies suggested for each Treatment flock
- On average, five additional management strategies were adopted by treatment flocks.
- All flocks monitored at 20, 30 and 40 weeks of age
- Assessed plumage damage and behaviour

The more strategies used, the better!

- Plumage damage 37,000 hens assessed. Five body areas – total score 0 (perfect) to 20 (worst)
- The more management strategies used in control or treatment flocks, the lower the plumage damage (p = 0.004)

	Flock	Plumage damage	CI
Control			
	Previous	4.86	4.74-4.98
	40 week	3.61	3.53-3.70
Treatment			
	Previous	6.18	6.08-6.28
	40 week	3.16	3.09-3.24

Severe feather pecking



Which specific strategies work?

- Individual strategies
- Clusters of strategies

- Paper in preparation……

Individual management strategies – effects on severe feather pecking

SFP was reduced throughout by:

- Provision of natural shelters on the range
- Feeding mash
- Mixing feeds during diet change
- Precautionary worming

- At 40 weeks only:
  - Using pecking blocks
  - Providing dustbaths on litter
  - Perch heights >50cm

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Combined management strategies – effects on severe feather pecking

- Group:

  Ensure good litter quality
  Actively maintain good litter quality
  Use Whitehorse bedding/ Sundown
  Provide dustbaths on the litter
  Scatter grit grain on the litter

  more litter management strategies, lower rates of SFP ($p = 0.045$)

- Group:

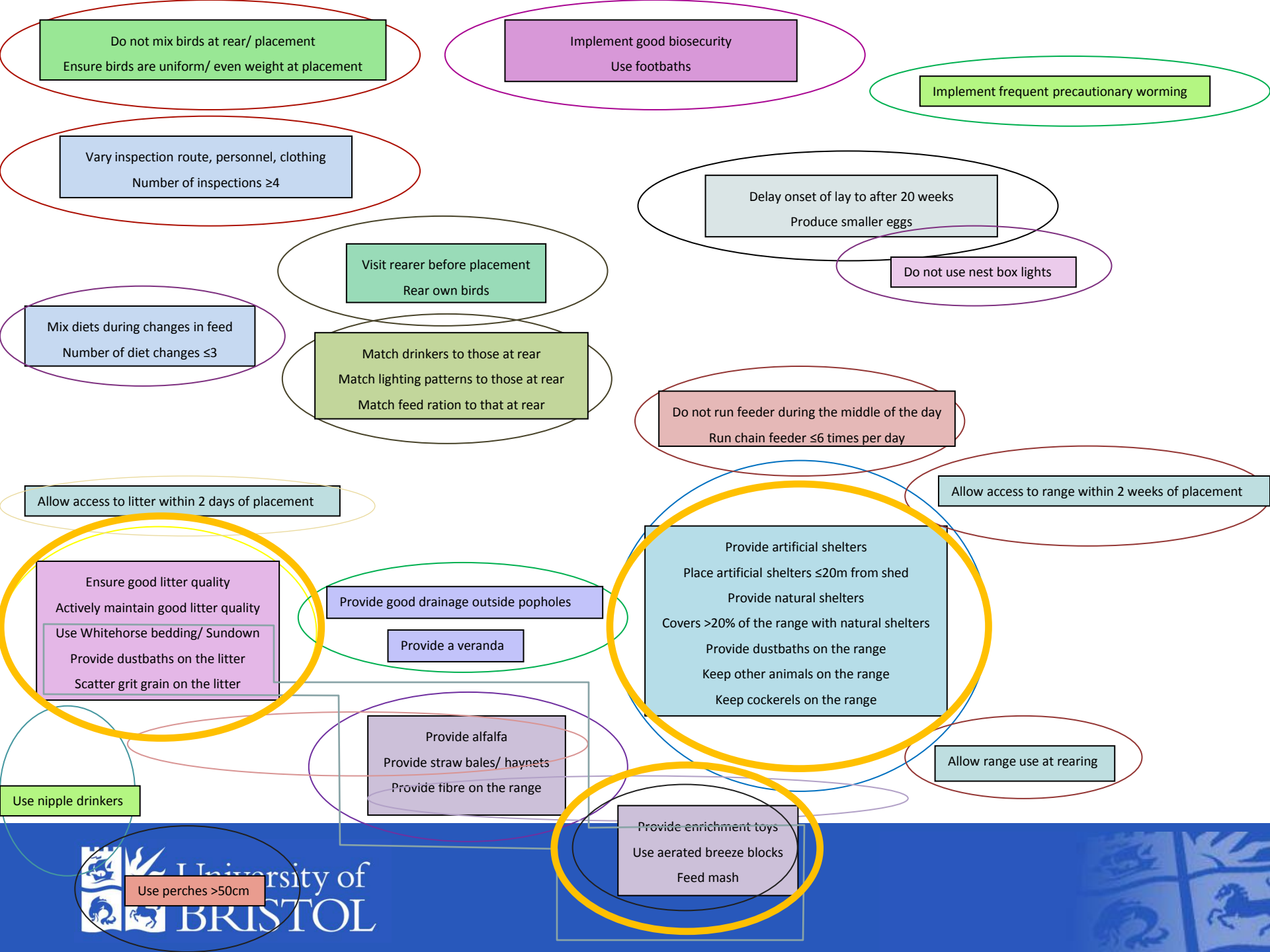
  Provide artificial shelters
  Place artificial shelters ≤20m from shed
  Provide natural shelters
  Covers >20% of the range with natural shelters
  Provide dustbaths on the range
  Keep other animals on the range
  Keep cockerels on the range

  more range-use strategies, lower rates of SFP ($p = 0.007$)

- Group:

  Provide enrichment toys
  Use aerated breeze blocks
  Feed mash

  more pecking distraction strategies, lower rates of SFP ($p = 0.010$)


Do not mix birds at rear/ placement
Ensure birds are uniform/ even weight at placement
Implement good biosecurity
Use footbaths
Implement frequent precautionary worming
Vary inspection route, personnel, clothing
Number of inspections ≥4
Delay onset of lay to after 20 weeks
Produce smaller eggs
Do not use nest box lights
Visit rearer before placement
Rear own birds
Mix diets during changes in feed
Number of diet changes ≤3
Match drinkers to those at rear
Match lighting patterns to those at rear
Match feed ration to that at rear
Do not run feeder during the middle of the day
Run chain feeder ≤6 times per day
Allow access to litter within 2 days of placement
Allow access to range within 2 weeks of placement
Ensure good litter quality
Actively maintain good litter quality
Use Whitehorse bedding/ Sundown
Provide dustbaths on the litter
Scatter grit grain on the litter
Provide good drainage outside popholes
Provide a veranda
Provide artificial shelters
Place artificial shelters ≤20m from shed
Provide natural shelters
Covers >20% of the range with natural shelters
Provide dustbaths on the range
Keep other animals on the range
Keep cockerels on the range
Provide alfalfa
Provide straw bales/ haynets
Provide fibre on the range
Allow range use at rearing
Use nipple drinkers
Provide enrichment toys
Use aerated breeze blocks
Feed mash
Use perches >50cm
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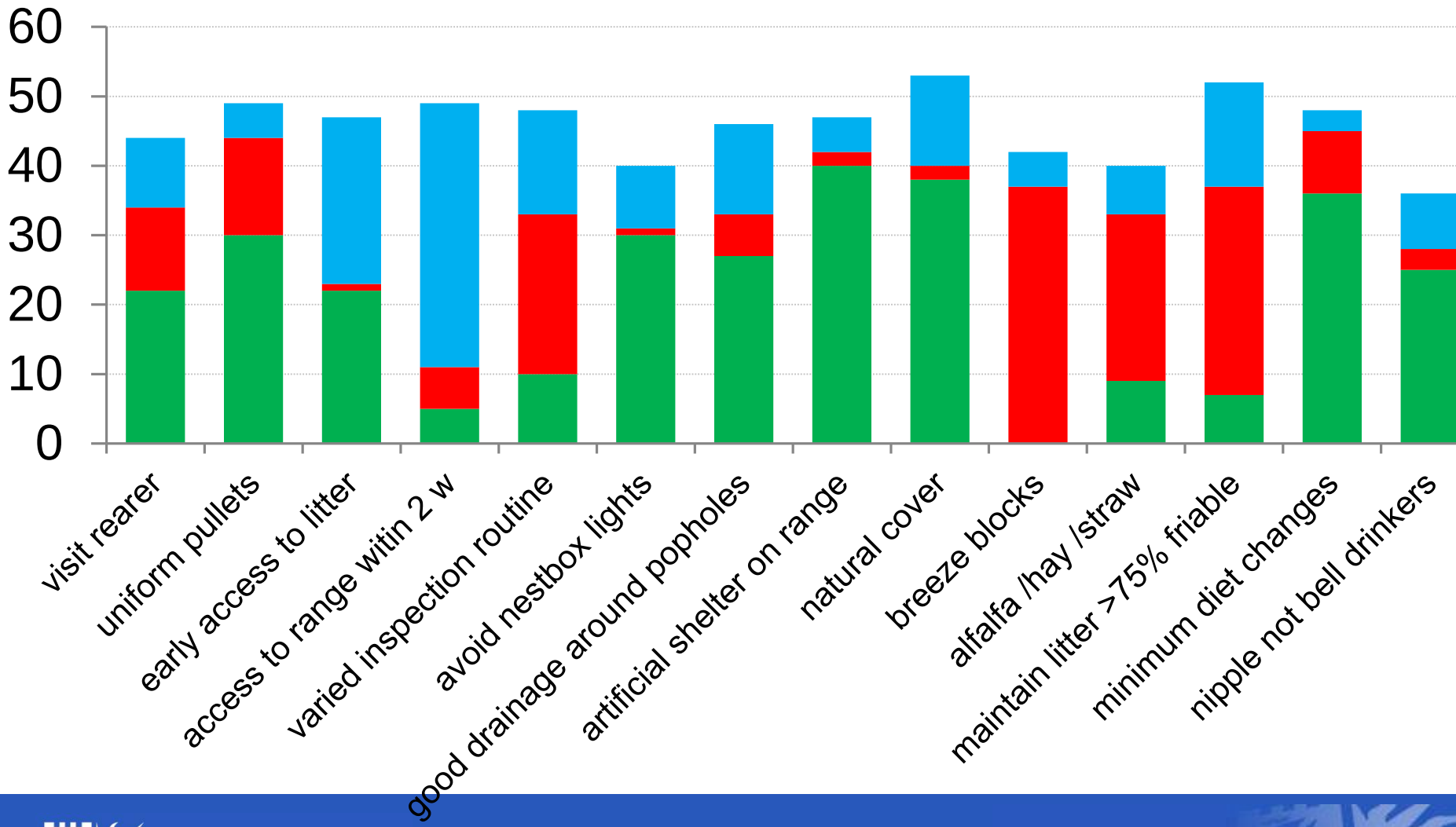
Barriers to better management

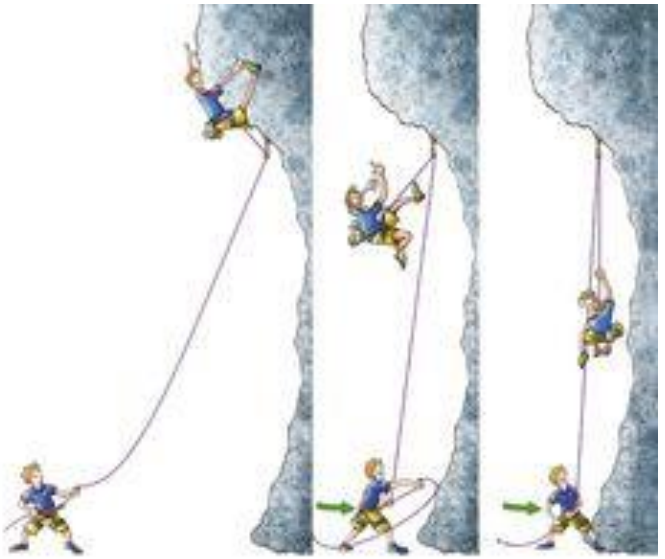
- Time
- Expense
- Conflicts in practice

Management strategy uptake in treatment flocks



Overcoming barriers

- Economic consequences – could be better explained
- Consumer willingness to pay (wtp)
- Banning beak trimming??



Consumer Views

e.g. Bennett et al., Anim. Welfare , in press

- Survey of 1776 consumers
- Information on FP and control strategies given
- Willingness-to-pay extra assessed using contingent valuation techniques
- Only 36% were aware of feather pecking
- Most were shocked to discover FP took place in free-range systems and many felt “betrayed”
- Respondents’ socio-economic status no predictor of their wtp
- Mean wtp was 5.6p/6 eggs to help prevent FP

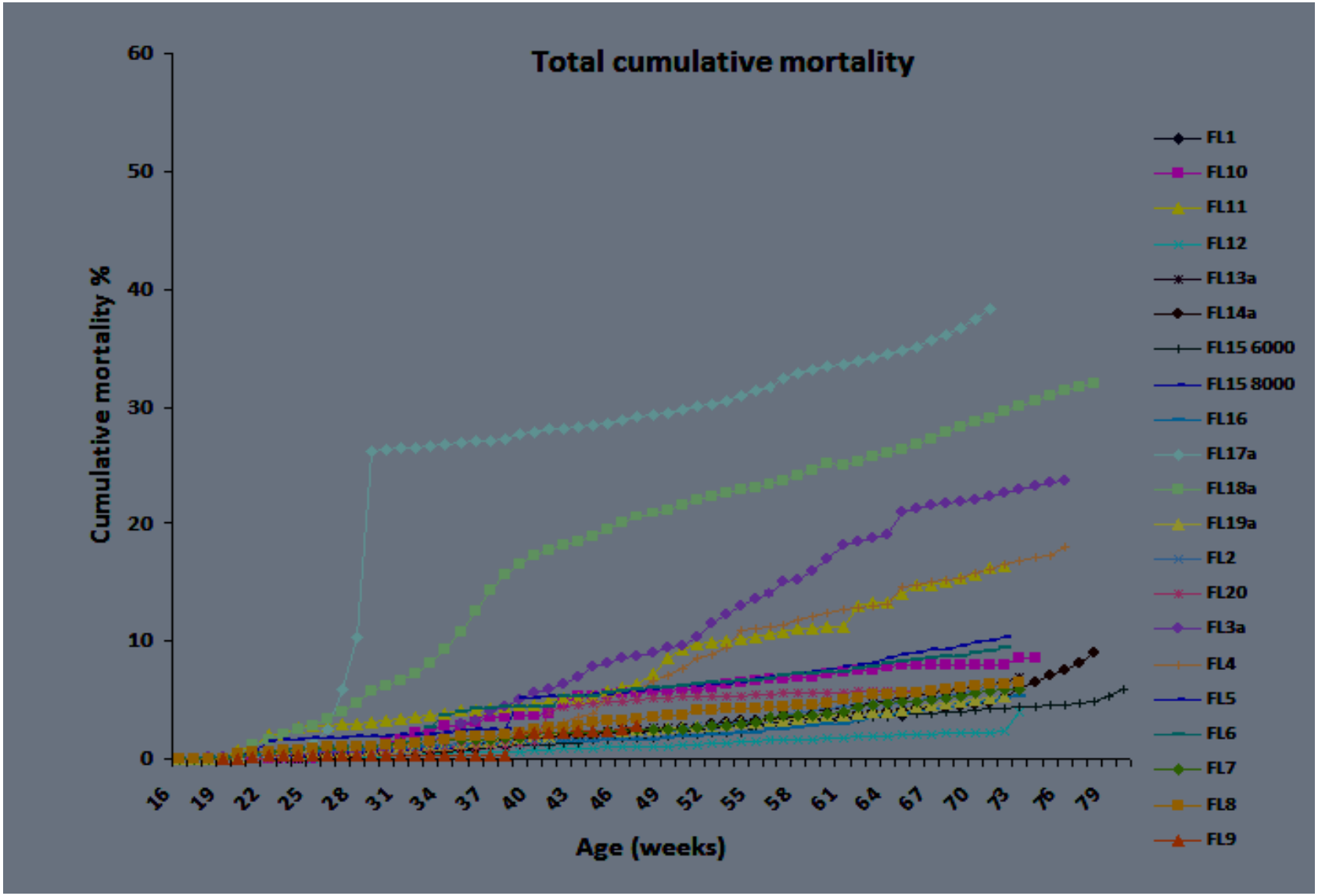
Banning beak-trimming?

- Will it force improved management or lead to poorer welfare?

- Can management strategies help with intact-beak flocks?

- 20 non-cage flocks enrolled, mean flock size 6329 (range 1200-16,000)
- Aim for < 9% mortality (average for FR beak-trimmed flocks)
- Plumage thresholds set

- No problems experienced during rearing period.
- Two flocks experienced significant problems during laying period


Total cumulative mortality
Cumulative mortality %
60
50
40
30
20
10
0
16
19
22
25
28
31
34
37
40
43
46
49
52
55
58
61
64
67
70
73
76
79
Age (weeks)
FL1
FL10
FL11
FL12
FL13a
FL14a
FL15 6000
FL15 8000
FL16
FL17a
FL18a
FL19a
FL2
FL20
FL3a
FL4
FL5
FL6
FL7
FL8
FL9

Comparison with previous flocks

Previous flocks with intact beaks – a significant improvement (p = 0.03)

Previous Flock Total Mortality (n=6)	Intact Study Flock Mortality (n=6)
12.07	6.55
6.43	2.89

Previous flocks beak trimmed – no significant change (p > 0.05)

Previous Flock Total Mortality (n=11)	Intact Study Flock Mortality (n=11)
7.88	13.12
3.21	10.59

Pecking behaviour

Lower than in most previous studies of commercial beak trimmed or intact beak flocks
Plumage condition very variable and correlated with mortality

Flock age (number of flocks observed)	Gentle feather pecking			Severe feather pecking		
	Mean rate (bouts/bird/h)	SE	CI	Mean rate (pecks/bird/h)	SE	CI
20 weeks (n=20)	0.27	0.09	0.10 ,0.43	0.08	0.04	-0.01 ,0.16
40 weeks (n=20)	0.12	0.05	0.01 ,0.23	0.35	0.14	0.07 ,0.62
65 weeks (n=19)	0.44	0.12	0.21 ,0.67	0.70	0.25	0.21 ,1.19

Costs vs Benefits

- Intact-beak to intact-beak + management strategies = overall significant benefit
- (e.g. farm A: cost of new MS £804, improved gross margin £13,440)

- Beak-trimmed to intact-beak + management strategies = no significant benefit
- (e.g. farm X, cost of new MS £1,608, no financial gain)

Successes

- Feasible management strategies have been devised
- These are highly effective (and cost-effective) for beak-trimmed flocks
- Some evidence that plumage is improving in UK flocks
- http://www.assurewel.org/layinghens
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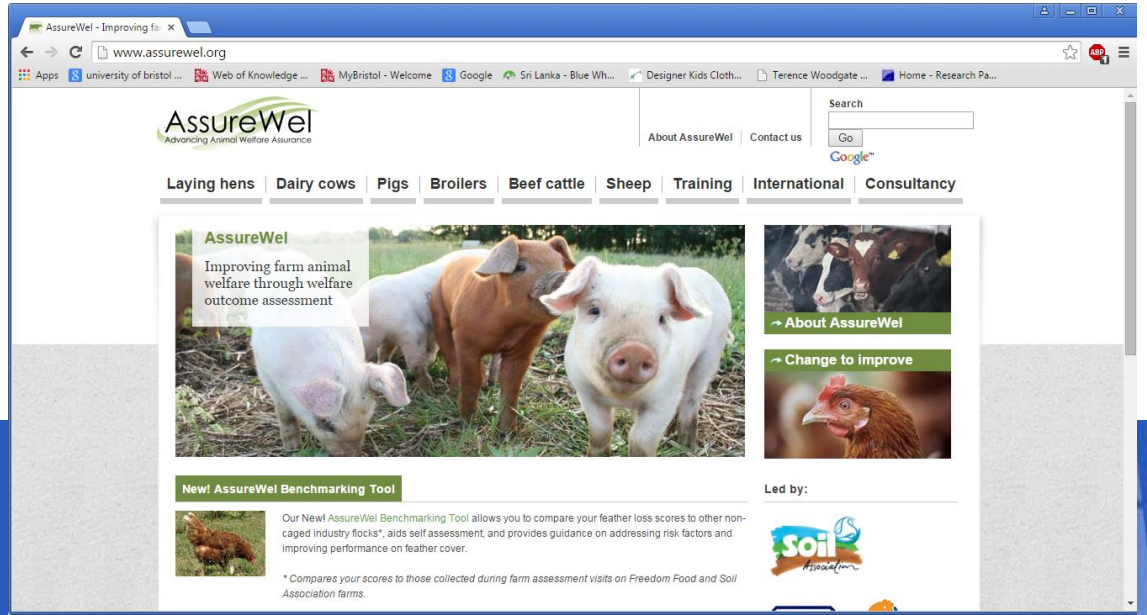

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Remaining challenges

- Uptake is variable – there are still many barriers
- Staff ratio (rather than flock size per se) can be a problem
- Strategies were devised to alter bird behaviour - not to deal with consequences of normal pecks with sharp beaks (infection)
- Management strategies alone may not fully protect intact beak birds.