OIE Training – The – Trainer's Workshop

Animal Welfare conditions during long distance transport by land

(chapter 7.3 of the OIE terrestrial Animal Health Code)

SESSION I

6. TRANSPORT OF POULTRY

OVERVIEW

- Characteristic of poultry transport
- Harvesting of poultry
- Transport duration
- Environmental risks
- At the arrival at the slaughterhouse - lairaging

CHARACTERISTIC OF POULTRY (BROILERS)

- Fast growing animals (42 days)
- High level of metabolism = loss of weight
- High level of heat and moisture production
- No sweating glands – heat regulation via evaporation – panting = high level of humid vapour production
- Technically impossible to feed and water during transport
- Birds have to be fasted prior to slaughter (12 – 16 hours)
- Food withdrawal depending upon duration of transport

FASTING OF BIRDS

- ❖ Fasting of 0, 8, 16 and 24 hours there is loss of weight of 0; 2,94; 4,32 e 5,61 %, respectively.
- **The duration of the fasting affects linearly the utilisation of the carcass before and after chilling.** Lyon *et al.* (1991)

- ❖ Fasting 0; 2; 4; 6; 8 hours there is loss of weight of 0; 0,88; 1,86; 2,14; 2,82; 3,56 %
  - Sarica *et al.* (1995

TRANSPORT TIMES

- **Beginning of transport – at the time of first animal being loaded into transport crate**
- **End of transport - at the time of last crate taken from lorry.**
- **Maximum transport time (scientific recommendations) – 12 hours.**

TRANSPORT TIMES/ FASTING

- Catching /loading
- Lorry 7000 chickens
- 4 workers 1000/h

} 2h

- Transport e.g. 4h
- Lairage max. 2h

- Total time of “transport” is 8h
- Food withdrawal 4h before loading

Images: Steps

HARVESTING OF CHICKEN

- Case 1 – Brazil, High welfare systems in the EU

– Excellent for welfare of chicken broiler

- Chicken are caught individually by both hands (dorsal catching)

Image: Steps

HARVESTING OF CHICKEN

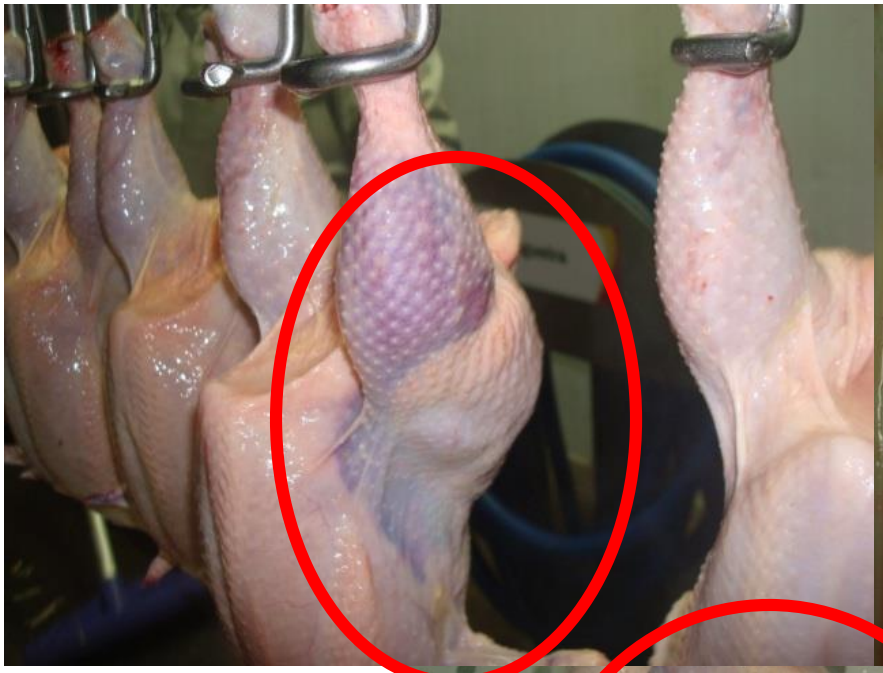
- Case 2 – EU countries
- less ideal world for chicken
- chicken MUST ! be caught and carried by both legs
- Holding by one leg is unacceptable – frequent dislocations of femur

HARVESTING OF CHICKEN

- **When chicken caught, held and carried by one leg**

- study in the Journal of Agricultural Engineering Research up to 20% of birds injured during catching that led to downgrading
- The Wall Street Journal –up to to 25% of broilers on some farms are hurt
- Reports from slaughter - bruising of the breast, thighs, or wings at the rate of 5-25%. •
- A scientific review - 35% of DOA broiler chicken mortality due to trauma - catching and transport injuries
- DOA mortality included hemorrhages from dislocated hips, thought to occur during catching and carrying by one leg (Vet records)

HARVESTING OF CHICKEN - BRUISES

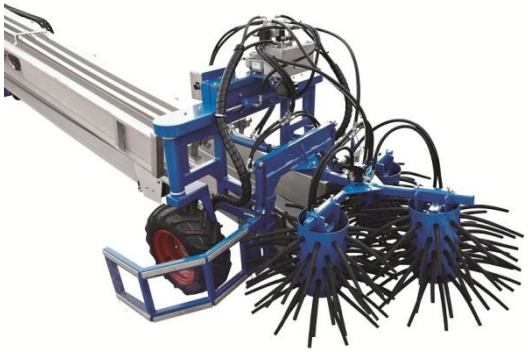


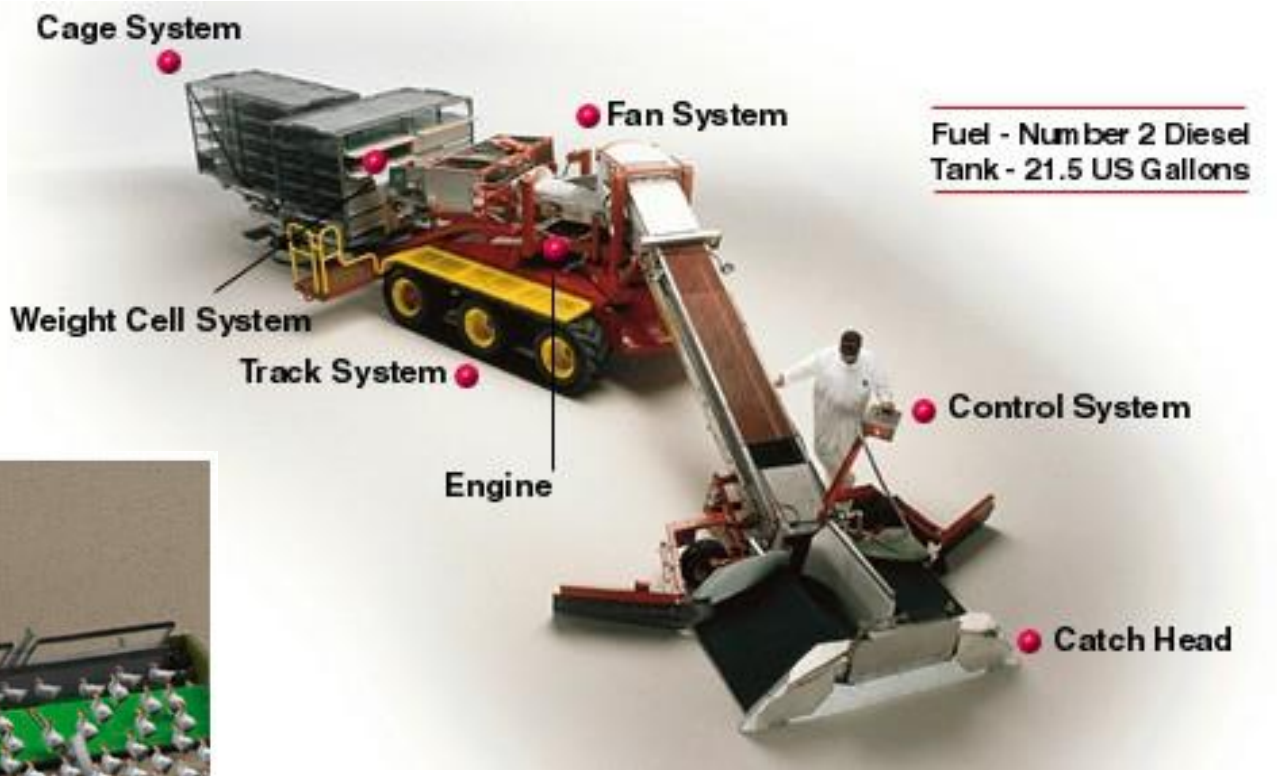
Images: Steps

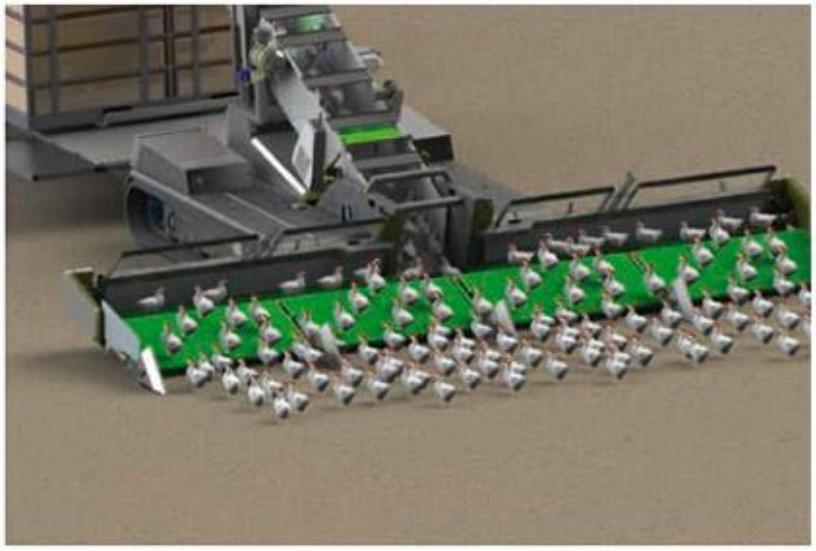
HARVESTING OF CHICKEN

- Case 3

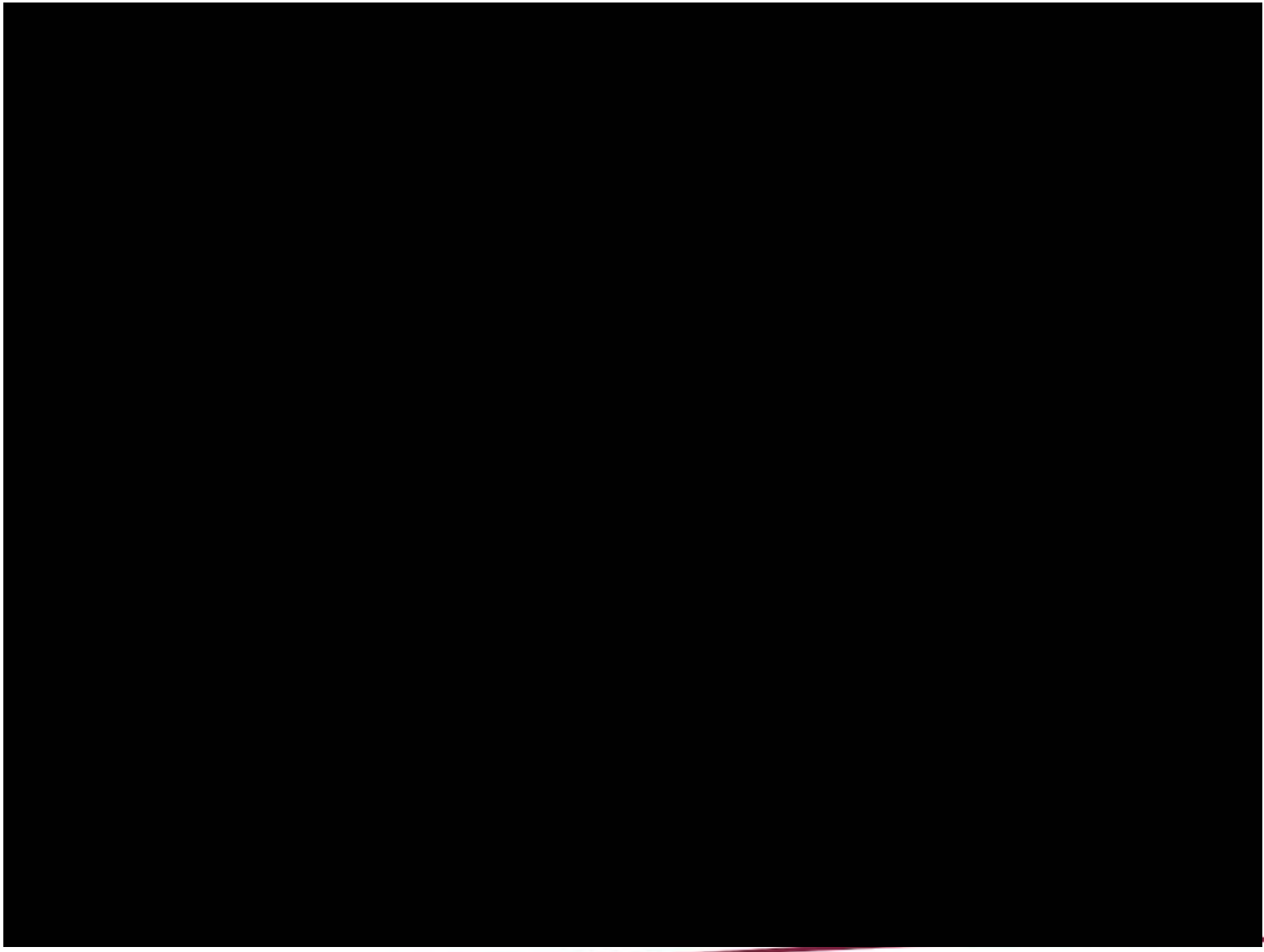
– EU Countries – automatised approach by use of harvesters







HARVESTING OF CHICKEN - VIDEO



CATCHING

BIRDS UNFIT FOR TRANSPORT

- Weak and any not alert
- Discharge from eyes or nostrils
- Swollen, dark or very pale head, neck or comb
- Emaciated weak thin birds
- Birds unable to rise, stand and walk – leg deformities, abnormalities, injury
- Prolapsed or bloody vents
- Dislocated bones

POULTRY UNFIT FOR TRANSPORT

Images: OMAFRA

POULTRY UNFIT FOR TRANSPORT

POULTRY TRANSPORT

- Drawer crate modules for broiler chicken and transport crates for small poultry - quails

POULTRY TRANSPORT

- Drawer crate modules on lorries

STOCKING DENSITIES / SPACE ALLOWANCE (Article 7.3.5.6)

Calculations for the space allowance for each animal should be carried out using the figures given in a relevant national or international document.

Factors which may influence space allowance:

- size, category and sex of the animals;
- expected weather conditions;
- vehicle and containers design;
- length of journey, quality of roads;

STOCKING DENSITIES - example

- European legislation following research data recommends following

Poultry other than day-old chicks: weight in kg	Area in cm^2 per kg
< 1,6	180 — 200
1,6 to < 3	160
3 to < 5	115
> 5	105

- That is usually transferred to more practical measuring – in kg/m2
- In case of chicken broilers (160 cm2 /kg) it is transferred to 63 kg/m2

STOCKING DENSITIES

- **Are determined according to average weight of birds at the farm**
- **Area of crate or module**

- i.e Anglia Modules Drawers (0.79m2)
- Linco Module Drawers (1.3m2)
- According to existing legislation it is pre determined to how many birds are loaded into each type of module – usually module producers recommendations are followed

STOCKING DENSITIES - GUIDELINES

Guideline for Loading Broiler Chickens into 44" x 28" Anglia Modules Drawers (0.79m^2)

Weight (kg)	1.75kg	2.00kg	2.25kg	2.50kg	2.80kg	3.50kg
	Maximum Number of Birds / Drawer					
Moderate (63 kg/m^2)	28	25	22	20	18	14
Extreme Heat (54 kg/m^2)	24	21	19	17	15	12

Guideline for Loading Broiler Chickens into 44" x 47" Linco Module Drawers (1.3m^2)

Weight (kg)	1.75kg	2.00kg	2.25kg	2.50kg	2.80kg	3.50kg
	Maximum Number of Birds / Drawer					
Moderate (63 kg/m^2)	48	42	37	34	30	24
Extreme Heat (54 kg/m^2)	41	36	32	29	26	21

RISK FACTORS

- Heat and cold stress - optimum ambient temperature
- Journey duration
- Duration of fasting
- Environmental risks

HEAT AND COLD STRESS

- Advances in genetic selection towards growth rates associated with lower resistance to thermal stress (Mitchell and Kettlewell 2012)

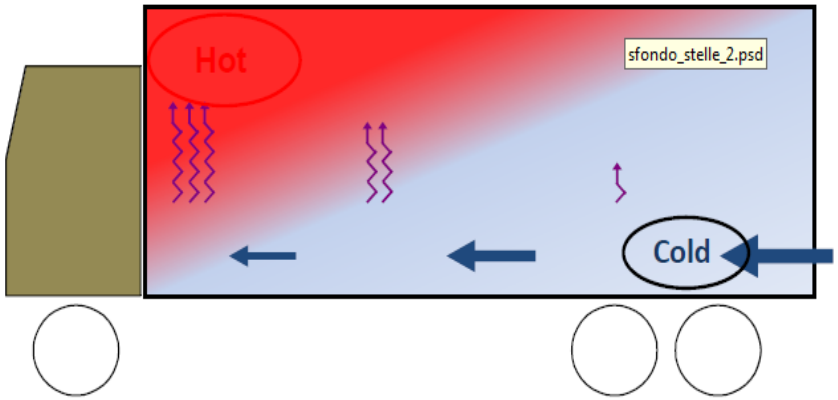
- RANGE of MIN and MAX TEMPERATURE

  5 - 24ºC (Mitchell and Kettlewell, 2008)

- However the optimum temperature is altered by humidity as with ambient humidity optimum temperature is changing

HEAT AND COLD STRESS

- Difference between outside temperature and temperature in the middle of the lorry (open curtains) can raise by 9 ºC in 2 h
- Difference between outside temperature and temperature in the lorry with side curtains down can be 20 ºC (after 1 h)
- There is a significant difference between hot spots and cold spots on the lorry

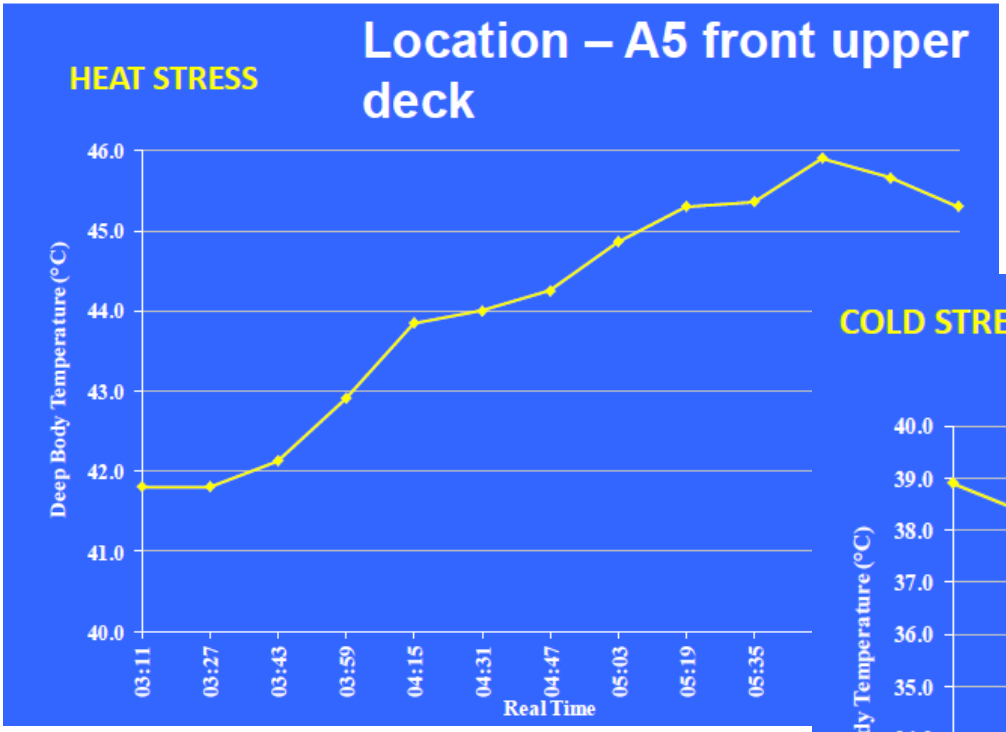


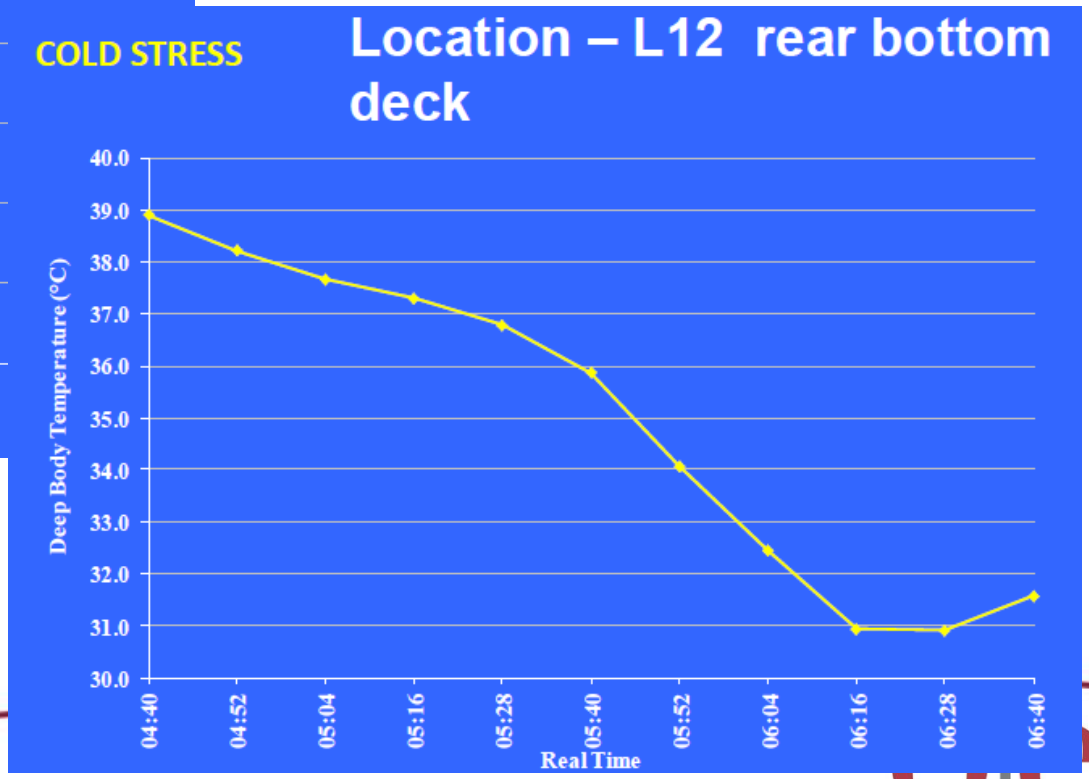
Adapted from M.A.Mitchell

- Air flow

- Convection

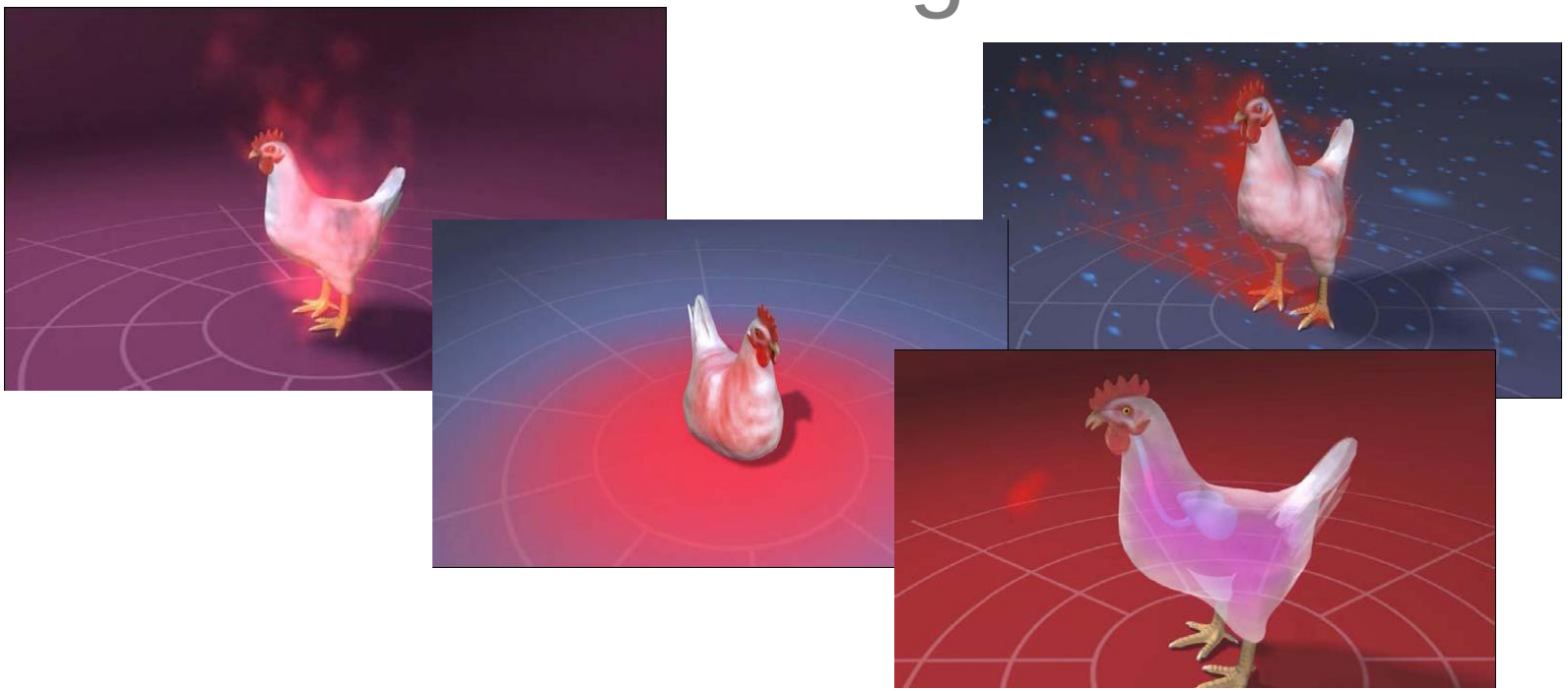
HEAT AND COLD STRESS (within the same lorry)





Adapted from M.A.Mitchell

HEAT AND COLD STRESS
Thermoregulation

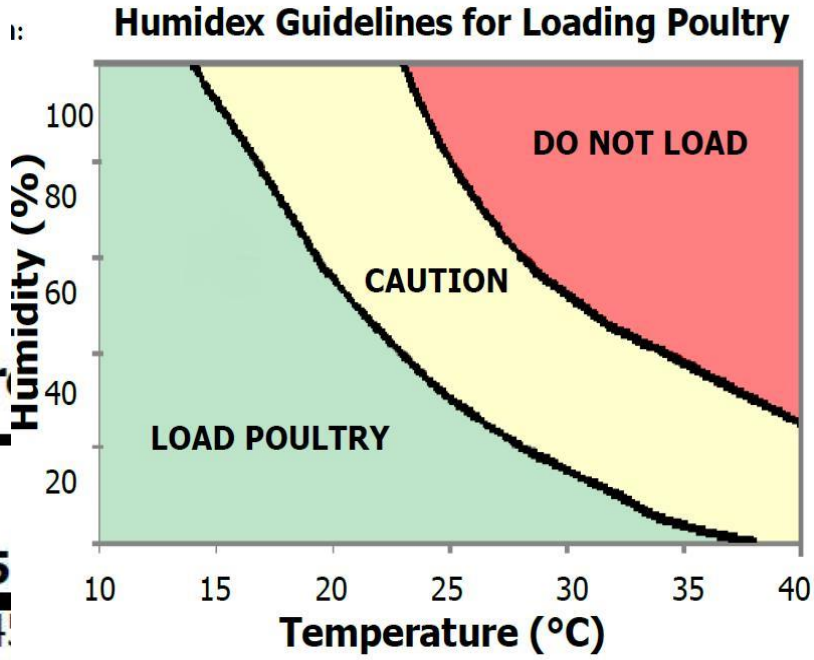


- In a plastic crate within the lorry there is a limited capacity to loose temperature by heat conduction, convection or radiation
- The effective loss of body temperature is via breathing – panting and evaporation. That however increases ambient humidity

Images: Steps

HEAT AND COLD STRESS

- Optimum temperature and humidity guidelines



Humidex = "Feels Like" Temperatur

Humidity	Temperature 20 C	25 C	30 C	35
50%	22	28	36	4
60%	24	30	38	46
70%	25	32	41	49
75%	26	33	42	50
80%	26	33	43	52
85%	27	34	44	53

Source: OMAFRA

JOURNEY DURATION

- With the length of transport, proportion of Death on Arrival (DoA) birds grows
- DoA figures (annual averages) may vary from 0.15% (Mitchell 2006) to 0.25% (Verecek 2006), 0.35 % (Bianchi et al 2005; Petracci et al 2006) 0.46% (Nijdam 2004).

- **(Vecerek *et al.* 2006)**

- **short journeys up to 50 km in length - 0.15% DoA**
- **long journeys 300km or greater - 0.86%. DoA**

DURATION OF FASTING

- TOO LATE FEED WITHDRAWAL - less than 2 hours before loading = increases metabolism and heat production while on the lorry.
- TOO EARLY FEED WITHDRAWAL OR TOO LONG JOURNEY – more than 24 hours of fasting prior slaughter

- stress, lower immune response, higher bacterial shedding (*Salmonella Typhimurium*)
- Some parts of body may have higher pH (e.g. thighs) some may have lower pH (e.g. breasts)

ENVIRONMENTAL RISKS

Any unnecessary prolongation of birds stay in the lorry affects the fasting period.

Drivers should be aware of conditions that may significantly alter conditions of birds in the lorry or the duration of transport such as

- **Rain , severe wind**
- **Snow storm**
- **Road closures**
- **Roll overs/crashes**
- **Construction**

LAIRAGING

- Upon arrival to the slaughterhouse, birds are either
- Immediatelly unloaded (crates) and slaughtered
- Immediatelly unloaded in crates and placed in the lairage halls
- Kept on the lorries for max 2 hours at a lairage parking places

Images: Steps

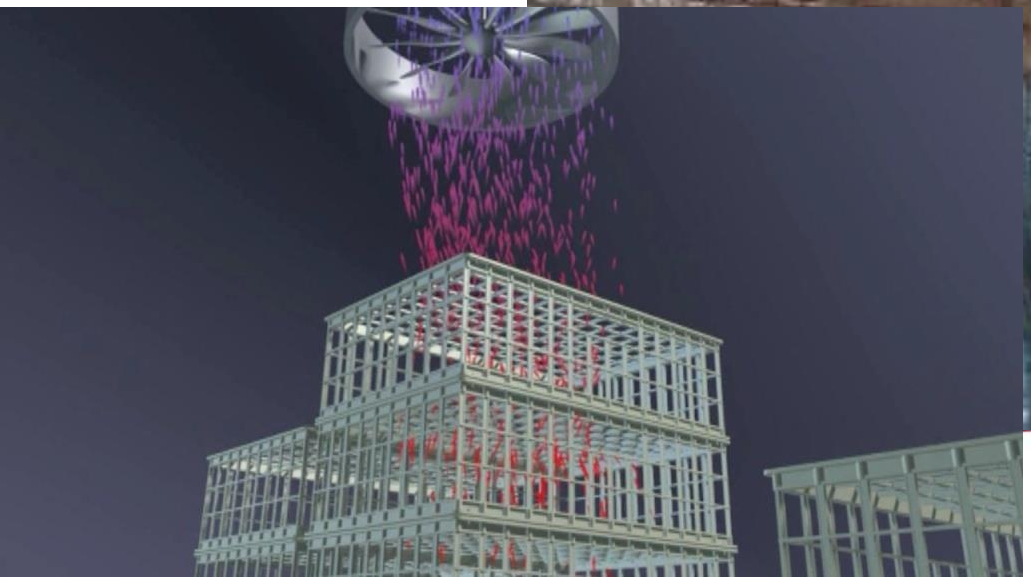
LAIRAGING

- During lorry parking air flow produced during road transport is not available anymore
- That results in significant heat production within the lorry/trailer
- Artificial ventilation / thermoregulation is a must
- Constant monitoring of temperature inside of the lorry is inevitable requirement

Images: Steps

LAIRAGING - EFFECTIVE VENTILATION

- The best systems do not force or blow air into the lorries but suck the heat and moisture from the top of it – causing air draught



Images: Steps

UNDLOADING

- Semi – automatic or manual:

- risk of rough handling/ throwing of crates

- Fully automatic

- crates are handled by automatic systems

RECAPITULATION

- Specifications of poultry transport
- Fasting of poultry
- Transport times
- Heat and cold stress
- Environmental risks
- Lairaging area management

Thank you for your attention

WORLD ORGANISATION FOR ANIMAL HEALTH

Protecting animals, preserving our future