

#### OIE Regional seminar on animal welfare during long distance transport

(Chapter 7.3 of the OIE terrestrial Animal Health Code)

13 - 15 March 2018, Chisinau, Moldova

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#### **7. 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

-2h

- Catching /loading
- Lorry 7000 chickens
- 4 workers 1000/h
- Transport e.g. 4h
- Lairage max. 2h



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

Images: Steps



- 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



- 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



- 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



- Case 3
- EU Countries automatised approach by use of harvesters



#### HARVESTING OF CHICKEN - VIDEO





# **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 <sup>2</sup> 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 <u>Broiler Chickens</u> into 44" x 28" Anglia Modules Drawers (0.79m<sup>2</sup>)

Weight (kg)	1.75kg	2.00kg	2.25kg	2.50kg	2.80kg	3.50kg
	Maximum Number of Birds / Drawer					
Moderate (63 kg/m²)	28	25	22	20	18	14
Extreme Heat (54 kg/m <sup>2</sup> )	24	21	19	17	15	12

Guideline for Loading Broiler Chickens into

44" x 47" Linco Module Drawers (1.3m<sup>2</sup>)

1./ 5Kg	2.00kg	2.25kg	2.50kg	2.80kg	3.50kg
N	of Birds	Birds / Drawer			
48	42	37	34	30	24
	48	Maximum 48 42	Maximum Number 48 42 37	Maximum Number of Birds4842373441263230	Maximum Number of Birds / Drawe      48    42    37    34    30      41    26    22    20    26

# **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 24<sup>o</sup>C (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 °C in 2 h
- Difference between outside temperature and temperature in the lorry with side curtains down can be 20 °C (after 1 h)
- There is a significant difference between hot spots and cold spots on the lorry







- Air flow - Convection

# HEAT AND COLD STRESS (within the same lorry)



#### 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

<mark>80</mark>

#### Optimum temperature and humidity guidelines 1:

Humidex = "Feels Like" Temperatur  $\frac{40}{40}$ 

		Temperature				
		20 C	25 C	30 C	<b>35</b>	
Humidity	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



#### 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



#### 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



#### 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





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