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Farm Health & Safety

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Occupational Health & Safety Risk in the **Poultry** Industry

– THE FACTS –

2005

Facts and Figures on Farm Health and Safety Series No 2



Australian Centre for Agricultural Health and Safety

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1. Introduction

Agriculture and horticulture enterprises produce commodities worth more than \$30 billion value per annum on around 135 000 enterprises spread across all states of Australia. However, that production is associated with a high cost in terms of human injury. High rates of serious injury and deaths on Australian farms are of concern to agricultural industry bodies, farmers, workers and farm enterprises and federal and state governments.

Farmsafe Australia, the national association of agencies with a commitment to reducing injury risk on Australian farms, will work with the poultry industry to assist in development of an industry strategy to reduce injury.

Strategic approaches to reducing enterprise injury risk are multifaceted and include:

- Identifying elimination and substitution options
- Improving design and engineering solutions
- Administrative or work practice solutions, including education and skills development
- Identification of requirements for personal protective clothing and equipment
- Identification of incentives for adoption of improved systems
- Ensuring compliance with regulatory requirements for supply of safe plant and equipment and safe operation in the farm workplace.

This document has been produced to provide guidance to those agencies and individuals who are working to reduce risk associated with poultry production in Australia. The publication is available electronically for use by educators and speakers in their efforts to raise awareness and promote poultry industry safety, and for those whose role is the development of public and industry policy to improve safety.



Poultry farming is a highly intensive industry in Australia with the majority of birds raised in large sheds. Figure 1 and Table 2 show the estimated number of birds on meat and egg producing poultry farms across Australia. Establishments involved in poultry meat and egg production comprise approximately 9.5% of all Australian agricultural enterprises. The poultry industry employs approximately 40,000 people directly, and another 140,000 people who depend on the industry indirectly for employment (Aust. Poultry CRC, 2005). The state of NSW has the largest share of poultry farms, with 43% of meat and 27% of egg producing units.

| | NSW | Vic. | Qld | SA | WA | Tas. | NT | ACT | Aust. |
|---|--------|--------|--------|--------|--------|-------|-----|-----|---------|
| Horticulture | 5,688 | 4,933 | 4,528 | 4,041 | 2,128 | 975 | 159 | 11 | 22,460 |
| Grain, grain/sheep/beef, sheep/beef, sheep, beef | 30,898 | 20,024 | 15,600 | 9,579 | 9,493 | 2,081 | 213 | 76 | 87,966 |
| Dairy cattle farming | 1,615 | 6,696 | 1,292 | 590 | 358 | 580 | 3 | 1 | 11,135 |
| Poultry farming (meat) | 339 | 186 | 126 | 67 | 58 | 14 | 1 | - | 790 |
| Poultry farming (eggs) | 130 | 152 | 84 | 30 | 61 | 18 | 5 | 1 | 481 |
| Other livestock | 1,369 | 752 | 1,038 | 159 | 282 | 97 | 3 | 3 | 3,786 |
| Sugar, cotton, other | 1,056 | 536 | 5,210 | 130 | 113 | 190 | 11 | 1 | 7,250 |
| Total | 41,092 | 33,282 | 27,900 | 14,654 | 12,499 | 3,953 | 395 | 93 | 133,868 |

Table 1 Establishments undertaking agricultural activity, Australia (30 June 2002)

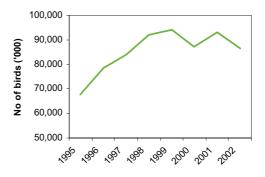
Source: ABS (Agricultural Commodities, Australia, 2001-02) (Pub No 7121.0)

Table 2Number ofbirds, Australia (2002)

| Poultry | Number birds ('000) |
|-------------------------------|------------------------|
| Broiler chickens (meat) | 72 144 |
| Chicken for egg production | 12 858 |
| Total chickens | 85 002 |
| Ducks | 567 |
| Turkey | 584 |
| Other poultry | 160 |
| Total | 86 313 |
| | |

Source: ABS (Agricultural Commodities, Australia, 2001-02) (Pub No 7121.0)

Figure 1 Poultry industry bird numbers, Australia 1995-2002



Source: ABS (2002)

Table 3 indicates non-intentional traumatic work-related deaths on Australian farms, by industry of working person for the years 1989-1992, where there was only 1 death that occurred to a poultry industry worker. Table 4 shows the number of fatal workers' compensation claims in various industries for the period 1994/95 to 1999/00 and 2001-2003 where there were a total of 7 deaths over nine years.

The poultry industry has one of the lowest death rates per annum of all the listed industries. This equates to 0.8 deaths per annum to produce \$1,508 million gross value product (eggs and meat 2001/02, ABS 2002), or 0.53 deaths per \$1 million gross value product.

| ndustry | Number | Percent |
|--------------------------------------|--------|---------|
| griculture | 327 | 87.7 |
| Poultry | 1 | 0.3 |
| Horticulture (fruit/vegetable/grape) | 17 | 4.6 |
| Cereal grains/sheep/cattle/pigs | 41 | 11.0 |
| Cereal grains | 15 | 4.0 |
| Sheep/cereal grains | 3 | 0.8 |
| Sheep | 28 | 7.5 |
| Meat cattle/cereal grains | 6 | 1.6 |
| Meat cattle | 64 | 17.2 |
| Dairy | 11 | 2.9 |
| Pigs | 2 | 0.5 |
| Sugar cane | 9 | 2.4 |
| Cotton | 5 | 1.3 |
| Other agriculture | 17 | 4.6 |
| Aerial agricultural services | 17 | 4.6 |
| Services to agriculture | 6 | 1.6 |
| Agriculture (not known) | 69 | 18.5 |
| Non agricultural industries | 46 | 12.3 |
| otal | 373 | 100 |

 Table 3
 Industry of working persons, farm-related fatalities, Australia 1989-1992

Source: Franklin et al (2001)

Table 4 Fatal workers' compensation claims*, by industry, Australia 1994/5–1999/00 and 2001-2003

| | Perio | Total | |
|------------------------------------|-----------------|-----------|-----|
| Industry | 1994/95-1999/00 | 2001-2003 | |
| Horticulture & Fruit Growing | 24 | 5 | 29 |
| Grain, Sheep & Beef Cattle Farming | 67 | 22 | 89 |
| Dairy Cattle Farming | 14 | 1 | 15 |
| Poultry Farming | 4 | 3 | 7 |
| Other Livestock Farming | 9 | 5 | 14 |
| Other Crop Growing | 14 | 4 | 18 |
| Not Stated | 0 | 0 | 0 |
| Total | 132 | 40 | 172 |

Source: NOSI1&2 Databases, NOHSC website February 2005

* Travel claims excluded

Australia-wide there were approximately 8,825 workers' compensation claims for the years 2001 and 2002 for injury in the agriculture sector. Of these, 536 (6%) were in the poultry industry, which equates to approximately 270 claims per year. A large proportion (96.5% in NSW) of workers in the poultry industry are covered by workers' compensation, so workers' compensation data may properly reflect the occupational health and safety risk in this industry (see Table 5).

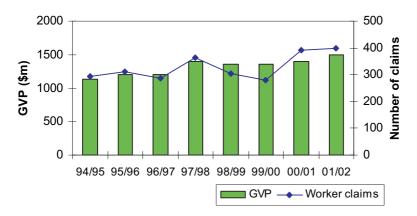
| Industry | Incidence per 1000 workers | | | | |
|------------------------------------|----------------------------|------|-------|--|--|
| | Female | Male | Total | | |
| Horticulture & Fruit Growing | 15.9 | 22.8 | 20.3 | | |
| Grain, Sheep & Beef Cattle Farming | 7.8 | 28.1 | 23.3 | | |
| Dairy Cattle Farming | 11.8 | 24.0 | 19.9 | | |
| Poultry Farming | 38.6 | 33.9 | 35.6 | | |
| Other Livestock Farming | 53.5 | 76.5 | 68.5 | | |
| Other Crop Growing | 35.1 | 34.1 | 34.3 | | |
| All agriculture | 15.7 | 27.8 | 24.2 | | |
| All industries | 11.6 | 22.5 | 17.4 | | |

 Table 5
 Incidence of workers compensation claims*, Australia 2000/01 (per 1000 workers)

Source: NOSI2 Databases, NOHSC website January 2005

*Duration of absence was greater than one week & travel claims excluded





Source:

(a) NOSI&2 Databases, NOHSC website (May 2005) (Note: *travel claims excluded, NOSI2 data provided as calendar year 2001 & 2002) (b) ABS (2002) (Note: *GVP for poultry slaughtering and egg production)

The above data indicates that the poultry farming industry should recognise and investigate the relatively high rate of injury claims.

Information describing the agent of injury, occupation and associated mechanism of injury for workers' compensation claims for the period 2001 to 2003 (incomplete year) is available for the poultry industry across Australia. This data follows similar trends shown in the NOHSC 1994/95-1999/00 data set.

Table 6 compares the number of claims for each agency in the poultry industry and with all agriculture. Injuries related to non-powered hand tools, appliances and equipment were associated with nearly 25% of claims in the poultry industry.

Table 6 Workers' compensation claims in the poultry industry, by agent of injury, Australia 2001-2003p

| Agency | Poultry ind | Total claims all agriculture (n=12,829) | |
|--|-------------|---|------|
| | n | % | % |
| Machinery and (mainly) fixed plant | 54 | 7.1 | 6.6 |
| Mobile plant and transport | 64 | 8.4 | 14.8 |
| Powered equipment, tools and appliances | 21 | 2.8 | 2.2 |
| Non-powered hand tools, appliances and equipment | 188 | 24.8 | 17.6 |
| Chemicals and chemical products | 9 | 1.2 | 0.9 |
| Materials and substances | 83 | 10.9 | 9.2 |
| Environmental agencies | 108 | 14.2 | 18.0 |
| Animal, human and biological agencies | 113 | 14.9 | 18.5 |
| Other and unspecified agencies | 119 | 15.7 | 12.1 |
| Not Stated | 0 | 0 | np |
| Total | 757 | 100 | 100 |

Source: NOSI2 Database, NOHSC website March 2005, 2003p=incomplete year

Note: Duration of absence was greater than one week & travel claims are excluded

Injuries associated with non-powered hand tools, appliances and equipment comprise a higher proportion of injuries in the poultry industry, compared to all agriculture combined.



Table 7 shows that the greatest number of workers' compensation claims in the poultry industry for the period 2001 to 2003 (incomplete year) were submitted by labourers and related workers (76%).

Table 7Workers' compensation claims in the poultry industry by occupation and agent of injury, Australia2001-2003p

| Agency | Managers & administr -ators | Professionals & para professionals | Trade persons | Clerks, sales and service | Production & transport workers | Labourers & related workers | Total |
|---|-----------------------------------|--|------------------|------------------------------|--------------------------------------|-----------------------------------|-------|
| Machinery & (mainly) fixed plant | 12 | 0 | 7 | * | 7 | 25 | 54 |
| Mobile plant & transport | * | 0 | * | * | 16 | 39 | 66 |
| Powered equipment, tools & appliances | 0 | 0 | * | * | 0 | 14 | 19 |
| Non-powered hand tools, appliances & equipment | 19 | * | 21 | 0 | 22 | 119 | 186 |
| Chemicals & chemical products | * | 0 | * | * | 0 | * | 13 |
| Materials & substances | * | * | 9 | * | 9 | 52 | 80 |
| Environmental agencies | 12 | * | 12 | 0 | * | 71 | 105 |
| Animal, human & biologi- cal | * | 0 | 17 | * | * | 82 | 110 |
| Other | 7 | 0 | 18 | * | 12 | 76 | 122 |
| Total | 66 | * | 94 | 35 | 73 | 482 | 755 |

Source: NOSI2 Database, NOHSC website April 2005, 2003p=incomplete year

Note: Duration of absence was greater than one week & travel claims are excluded

*Less than 5 cases



7. Workers' compensation claims—non-powered hand tools, appliances and equipment

Table 8 indicates workers' compensation claims in the poultry industry for the period 2001 to 2003 (incomplete year) associated with non-powered tools and equipment. The main breakdown agency was *fastening*, *packing and packaging equipment* (54%).

 Table 8
 Workers' compensation claims in the poultry industry associated with non-powered hand tools and equipment, by mechanism of injury, Australia 2001-2003p

| | Hitting | | | | | | | |
|--|--|--|-----------------------------------|----------------------|-------------------------------|-----------------------------|-------------------------|-------|
| Breakdown Agency | Falls, trips & slips of a person | objects with a part of the body | Being hit by moving objects | Lifting/ carrying | Handling withou lifting | Repetitive move- ment | Total body stressing | Total |
| Hand tools, non-powered, edged | 0 | 7 | * | * | 8 | * | 11 | 22 |
| Other hand tools | 0 | 8 | 0 | * | * | 0 | 6 | 14 |
| Fastening, packing & packaging equipment | 9 | * | 11 | 63 | 11 | * | 77 | 102 |
| Furniture & fittings | * | * | 0 | 0 | * | 0 | * | 15 |
| Other utensils | 0 | 0 | 0 | * | 0 | 0 | * | * |
| Ladders, ramps, stairways & scaffolding | 9 | 0 | 0 | 0 | * | 0 | * | 10 |
| Other non-powered equipment | * | 6 | 0 | 8 | * | 0 | 13 | 24 |
| Total | 26 | 31 | 18 | 79 | 30 | 5 | 114 | 189 |

Source: NOSI2 Database, NOHSC website March 2004, 2003p=incomplete year Note: Duration of absence was greater than one week & travel claims are excluded *Less than 5 cases

Poultry producers should address manual handling and ergonomic issues associated with work in the poultry industry.



8. Workers' compensation claims—animal, human and biological agents

Table 9 shows workers' compensation claims in the poultry industry for the period 2001 to 2003 (incomplete year) associated with animal, human and biological agencies. The main mechanism of injury associated with handling poultry was *body stressing* (70%).

A large proportion of body stress injuries (89%) were associated with muscular stress while lifting, carrying or handling objects. Less than 10% of body stress injuries were associated with repetitive handling.

 Table 9
 Workers' compensation claims in the poultry industry associated with animal, human and biological agencies, by mechanism of injury, Australia 2001-2003p

| Breakdown Agency | Hitting objects with a part of the body | Being hit by moving objects | Body stress- ing | Chemicals & other substances | Mental stress | Other & unspecified mechanisms | Total |
|--------------------------|--|-----------------------------------|---------------------|------------------------------------|---------------|--------------------------------------|-------|
| Live four-legged animals | 0 | * | * | 0 | 0 | 0 | * |
| Other live animals | 0 | 10 | 56 | * | 0 | * | 70 |
| Non-living animals | 0 | * | 20 | 0 | 0 | * | 25 |
| Human agencies | * | * | * | 0 | 6 | * | 16 |
| Total | * | 17 | 80 | * | 6 | 7 | 114 |

Source: NOSI2 Database, NOHSC website March 2004, 2003p=incomplete year

Note: Duration of absence was greater than one week & travel claims are excluded

*Less than 5 cases



9. Workers' compensation claims—environmental agents

Table 10 indicates workers' compensation claims in the poultry industry for the period 2001 to 2003 (incomplete year) associated with environmental agencies. The main mechanism of injury was *falls, trips and slips* of workers in both indoor and outdoor work environments.

| Breakdown Agency | Falls, trips & slips of a person | Hitting objects with a part of the body | Sound & pressure | Body stressing | Other & unspecified mechanisms | Total |
|---------------------------------|--|---|------------------|----------------|--------------------------------------|-------|
| Outdoor environment | 49 | * | 0 | 8 | * | 62 |
| Holes in the ground | 8 | 0 | 0 | 0 | 0 | 8 |
| Wet, oily or icy surfaces | 6 | 0 | 0 | 0 | 0 | 6 |
| Hazardous objects | * | 0 | 0 | * | 0 | 8 |
| Other traffic & ground surfaces | 22 | 0 | 0 | * | 0 | 25 |
| Other | * | * | * | * | 0 | 15 |
| ndoor environment | 46 | 0 | * | * | 0 | 53 |
| Steps & stairways | 12 | 0 | 0 | 0 | 0 | 12 |
| Wet, oily or icy surfaces | 14 | 0 | 0 | 0 | 0 | 14 |
| Other traffic & floor areas | 13 | 0 | 0 | 0 | 0 | 16 |
| Other | * | 0 | * | 0 | 0 | 11 |
| Underground environment | * | 0 | 0 | 0 | 0 | * |
| Total | 96 | * | * | 8 | * | 109 |

Table 10Workers' compensation claims in the poultry industry associated with environmental agencies,
by mechanism of injury, Australia 2001-2003p

Source: NOSI2 Database, NOHSC website March 2004, 2003p=incomplete year

Note: Duration of absence was greater than one week & travel claims are excluded

*Less than 5 cases



10. Workers' compensation claims—a New South Wales study

In 1999/2000 poultry farming was the fifth largest rural industry in NSW employing about 3,700 workers (3% of total rural sector). A study of work-related injuries and diseases in poultry farming in NSW using workers' compensation claims data over a nine year period 1991/1992-1999/2000, found that the poultry industry ranked second highest for injury among all rural industries with an incidence rate of 47.4 claims per 1,000 employees (Kamara et al, 2002).

Manual handling was the leading mechanism of injury (Figure 3) and the key agency associated with manual handing injuries was *fastening, packing and packaging equipment* (38%). Most injured workers suffered from *sprains and strains* (53%) affecting the upper limbs and upper or lower back. The occupations most at risk were *trades assistants and factory hands* (32%) followed by *agricultural labourers and related workers* (24%) (Kamara et al, 2002).

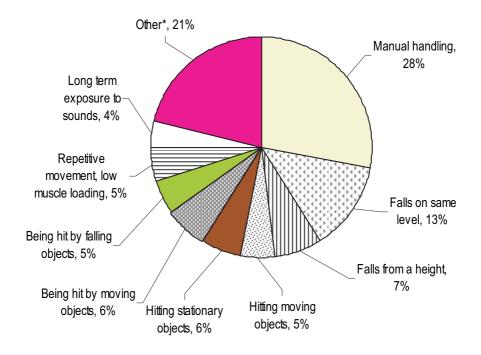


Figure 3 Mechanisms of injury in NSW poultry farming employees, 1999-2000 (n=174)

Source: WorkCover NSW (Kamera et al 2002) *Includes 21 other mechanisms

This study confirms the importance of safe manual handling issues (see Section 7) in the poultry industry.

Respiratory problems (such as asthma or allergy) can develop from prolonged exposure to air borne contaminants which may be present in poultry sheds. Such contaminants include:

- dust containing feed, feacal and litter particles, feather barbules, skin debris, fungal fragments and spores, viruses, bacteria and endotoxins (toxins of gram negative bacteria)
- gases such as ammonia, and carbon dioxide
- pesticides, disinfectants and litter additives.

Dust and gas concentrations are affected by factors such as bird and litter age, ventilation rate, time of day, bird activity, temperature and relative humidity. High ammonia concentrations can be damaging to poultry workers, causing eye and respiratory tract irritation and also increase susceptibility of the respiratory system to other airborne pathogens (Jester and Malone 2002).

While there are a number of diseases which affect birds raised in intensive situations, transmission of disease to humans has been more commonly reported with avian influenza and avian chlamydiosis.

Avian influenza (which is a Type A strain of influenza virus) is a highly lethal disease of poultry. Since 1997 a growing number of fatal human infections caused by a highly virulent strain (H5NI) have occurred outside Australia. Transmission to humans is thought to have resulted from direct contact with infected sick or dead poultry or their droppings, or contact with contaminated litter or surfaces. World health authorities are closely monitoring disease outbreaks of avian influenza in Asia and are concerned that emerging new strains may become transmissible between humans (FAO, 2005).

Avian chlamydiosis caused by *chamydia psittaci* can be transmitted to humans by inhalation of infected dusts or material and is a generalized disease with acute or mild symptoms involving the respiratory tract. Outbreaks are more commonly recorded in aviary bird handlers than poultry workers.

Salmonella enterica is a bacterial disease with numerous serotypes pathogenic to animals and humans and is classified as a food borne disease which can be carried by all species of poultry. Salmonellosis is a risk for poultry processing and packaging workers where raw meat is being handled.

Analysis of Australian workers' compensation data did not reveal any evidence of health effects among poultry industry workers associated with zoonoses or respiratory disease.

Workers and managers in the poultry industry should keep zoonotic and respiratory disease risk under review and take necessary action.

12. Noise and hearing loss

Noise on farms has been well established as posing risk of noise induced hearing loss and tinnitus in farmers and farm workers. No measured noise levels for poultry handling activity are available, however the following table indicates the noise levels with recommended exposure limits for a range of relevant activities such as grain and feed handling machinery use and operation.

 Table 11
 Average noise levels and recommended exposure limits for common farm machinery and activities

| Machinery/worker position during normal operating conditions | Noise level at operator's ear Average & Range (95% CI) LAeq dB(A) | Recommended exposure limits with- out hearing protection. NB: Noise exposure risk for each activity in the day is cumulative toward the over- all noise exposure risk.**. |
|---|---|---|
| Air compressors | 86 (77- 95) | 7 hrs (15 mins - 8 hrs+) |
| All terrain vehicles (ATVs) | 86 (84 - 87) | 7 hrs (4 - 8 hrs) |
| Angle grinders | 98 (96 - 100) | 20 mins (15 - 30 mins) |
| Others in workshop | 90 (87 - 93) | 2 hrs (1 - 5 hrs) |
| Augers | 93 (89-96) | 1 hr (30 mins – 3 hrs) |
| Bench grinders | 99 (94 - 104) | 18 mins (5 mins - 1 hr) |
| Others in workshop | 89 (82 -96) | 3 hrs (40 mins - 8 hrs) |
| Bulldozers | 99 (97 - 100) | 18 mins (15 - 30 mins) |
| Chainsaws | 106 (104 - 107) | 3 mins (2 - 5 mins) |
| Others stacking wood | 96 (93 - 99) | 40 mins (15 - 50 mins) |
| Circular saws | 99 (98 - 101) | 18 mins (10 - 20 mins) |
| Others in workshop | 89 (84 - 94) | 3 hrs (1- 8 hrs) |
| Farm trucks | 85 (83 - 88) | 8 hrs (4 - 8 hrs) |
| Forklifts | 84 (81-88) | 8 hrs (4 - 8 hrs) |
| Firearms | Lpk 140+ dB | no exposure |
| Harvesters | 83 (75 - 91) | 8 hrs (2 - 8 hrs) |
| Irrigation pumps | 100 (96 - 104) | 15 mins (5 -30 mins) |
| Motorbikes - 2 wheel | 81 (70 - 92) | 8 hrs (1.5 - 8 hrs+) |
| Packing shed workers | 80 (78 - 82) | 8 hrs (8 hrs+) |
| Tractors with cabins | 76 (75 - 78) | no limit |
| Av. increase with radio on | 3 - 5 dB | 8 hrs (8 hrs+) |
| Others in field | 85 (80 - 90) | 8 hrs (2 - 8 hrs+) |
| Tractors without cabins | 92 (90 - 93) | 1.5 (1 - 2) hrs |
| Others in field | 82 (78 - 86) | 8 hrs (6 - 8 hrs+) |

Source: Farmsafe Australia. Noise injury prevention strategy.(2002)

** For example: If exposed to a noisy activity for half the recommended daily limit {eg. Angle grinder for 10 min of a 20 min daily limit}, the remaining noise exposure in the day should not exceed half the recommended daily limit for another activity (eg. A limit of 4 hrs instead of 8 hr on a tractor with a radio).

Poultry farm managers need to ensure that all workers are protected from damaging noise levels.

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