

**Canada to Nepal Export Report- Chantecler Chickens
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Part 1: Product Information

Introduction to the Chantecler Chicken

Chantecler chickens are the first chickens to be bred in Canada, and work on the breed started in 1908 in Quebec, Oka (The Livestock Conservancy [TLC], n.d.). They were bred for egg and meat production and to withstand the harsh Canadian climate (TLC, n.d.). Chantecler chickens, along with many other heritage animals, are available for purchase from Kevin Fitch at Active Life Farm. All their animals are raised on pasture, with no medication or added hormones. Spring through to fall their chickens are all housed in a mobile pen that has no floor so the chickens have access to grass and insects. During the winter, their chickens are moved to the greenhouse. Active Life Farm is located in Londonderry, Nova Scotia at 293 Baseline Road. For more information they can be contacted by email at contact@activelifefarm.ca or by phone at 1-902-668-2038.

Benefits to Canada

Selling Chantecler chickens to Nepal would create a market for producing Chantecler chickens since in Canada it is more of a heritage breed and is not used in large scale farming. The significant benefit to Canada is that it would increase the population of an endangered breed. According to Rare Breeds Canada (n.d.), the Chantecler chicken is an endangered breed meaning there are only 100-499 Chanteclers known to still exist. The Chantecler chicken is a part of Canada's history, since it is the first breed of chickens to originate in Canada (TLC, n.d.). Exporting it to

Nepal would be a great way to increase their population and prevent them from going extinct.

Compared to Nepal's Current Species

The comb and the wattle have an important role in chickens, to dissipate heat from the chicken (Wolfenson, Yael, Frei, Snapir & Berman, 1981). Chickens have evolved combs and wattle that are not insulated or protected to allow maximum removal of heat (Midtgard, 1989). These combs and wattle are susceptible to frostbite because they have no protection or insulation (Midtgard, 1989). The Chantecler chicken can handle down to minus 32 C because it has a very small comb and wattles (Heinrichs, 2013). This allows the Chantecler chicken to efficiently produce eggs even in cold climate, but it will go down in efficiency in the hotter summer days (Heinrichs, 2013). American New Hampshire and Australian Black Australorp are two dual purpose (lay eggs and good for meat) chickens that can already be found in Nepal (Food and Agriculture Organization of the United Nations [FAO], 2014). They have typical combs and wattles that are susceptible to frostbite. Although they may lag behind in the winter months they excel in the summer months and have been known to be great egg producers throughout Nepal's climate (FAO, 2014). A farm consisting of both breeds would have a sufficient supply of eggs all year long and one may surpass the other depending on the climate in their region of Nepal.

Inputs Required

Feed may be an input in some situations but chickens can also live off of insects and grass for most of the year. For the winter, or for birds that have very little access to the outdoors feed will be needed. Fortunately, feed is easily accessible in Nepal from

companies like Ratna feed, Sagar and Valley Feed Industries and 109 other feed companies across nepal (FAO, 2014). Water is also an input but in Nepal rainfall is adequate and even surpasses Ontario (The World Bank Group [WBG], n.d.). Water quality may be a concern as it can affect their eggs and meat products, since some of the water contaminants may be deposited in the eggs and meat, and passed onto humans (Olkowski, 2009). Even low concentrations of arsenic, benzene, cadmium, lead, and trichloroethylene can cause a decrease in egg production, egg weight and increase in embryonic mortality (Olkowski, 2009). All of which can be commonly found near waste sites (Olkowski, 2009). Arsenic is rarely a concern, only in deep-aquifer tube well where 50% were over limit in a study of several water sources (Warner N.R, Levy J, Harpp K, & Farruggia F, 2007). High levels of sodium chloride can also lead to defects in the egg's shell and increased embryonic deaths (Olkowski, 2009). A water filter system could prevent these contaminants from being introduced into the chickens and also gives Nepalese farmers a clean water source. Ceramic filters can be used to remove the contaminants and are produced in developing countries like Cambodia and Nicaragua and are affordable to Nepalese farmers (Centers for Disease Control and Prevention [CDCP], 2012).

Diseases in Chicken Farming

Like all breeds of chickens biosecurity is important and prevention of disease is very important. In Nepal, disease outbreaks in the poultry sector, are a large problem leading to many farmers dropping out of the poultry sector (FAO, 2014). 63.33% of the people who give up on poultry farming say it is because of or involved a high mortality

that made chicken farming non-profitable (FAO, 2014). In 2008-2009 there was 2330 outbreaks of coccidiosis disease (FAO, 2014), which can lead to severe damage of the ceca and small intestine (Alberta Agriculture and Forestry [AAF], 2001). The disease can be spread via their feces, since coccidiosis can stay viable for many months, it can easily be passed onto the next flock (AAF, 2001). The disease can be killed off, by freezing, extreme heat and dryness (AAF, 2001). To prevent the coccidiosis disease chicks, water and feed should be kept away from feces (AAF, 2001) possibly with an elevated cage system that allows the feces to drop underneath the cage away from the chickens. Making sure that litter is dry and their water isn't getting contaminated by birds walking through it can prevent an outbreak (AAF, 2001). Coccidiosis can also be treated by adding corrid to water for 5 days, if done immediately when the first signs show up, the chicken will make a full recovery (Willow Branch Farm [WBF], 2013). This may be problematic in a country with such a low literacy rate, if they don't have an understanding of how to treat the birds or how to detect/prevent it their chickens may be left sick and untreated.

Other diseases include newcastle disease, fowl cholera, fowl pox, gumboro, mycoplasmosis, pullorum, and hydropericardium syndrome which led to around 20,000 deaths in 2008-2009 (FAO, 2014). Younger chickens are far more susceptible to disease and special care should be taken until they reach at least 20 weeks of age (FAO, 2014). In backyard chicken farms approximately $\frac{1}{3}$ of chickens raised, are lost to predators (FAO, 2014). Shelter would help with both by separating the birds from possibly disease carrying birds and separating them from possible predators. Shelter would also allow for easier cleanup of feces since all the chickens are located in a

secluded area and feces are often a source of the disease (FAO, 2014). Shelters can easily be constructed from scrap metal and wood, although being another expense it may pay off in the long run.

TABLE 22
Important poultry diseases and their epidemiology (2008/09)

Disease	No. of outbreaks		No. of affected		No. dead	
Newcastle disease	128	3.7%	23 968	4.1%	5900	20.6%
Fowl cholera	31	0.9%	4 685	0.8%	201	0.7%
Fowl pox	398	11.5%	14 498	2.5%	193	0.7%
Gumboro	375	10.9%	291 519	50.3%	12 015	42.0%
Mycoplasmosis (<i>M. gallisepticum</i>)	32	0.9%	49 079	8.5%	1 437	5.0%
Pullorum (<i>S. pullorum</i>)	138	4.0%	64 382	11.1%	1 584	5.5%
Coccidiosis	2 330	67.5%	118 806	20.5%	6 401	22.4%
Hydropericardium syndrome	19	0.6%	12 995	2.2%	867	3.0%

Source: Annual epidemiological bulletin 2009, Veterinary Epidemiological Unit

Figure 1. Shows the number of outbreaks, number of chickens affected and number of chickens killed by various diseases. The graph was retrieved from the FAO at <http://www.fao.org/3/a-i3964e.pdf>.

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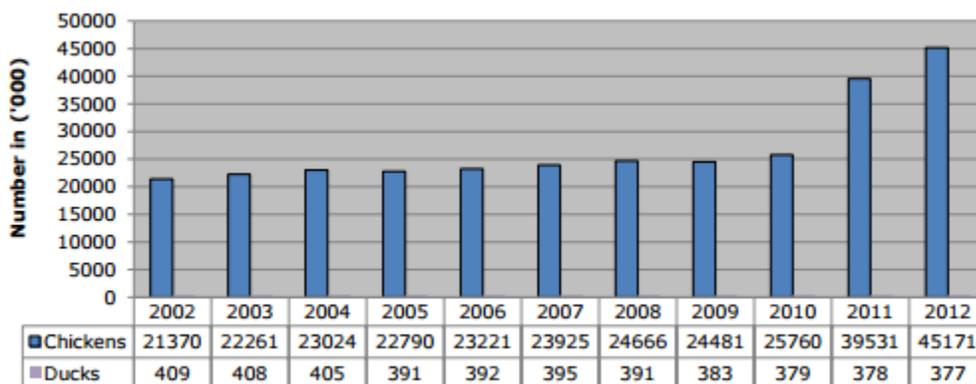
Part 2 Export Potential to Nepal

Introduction to Nepal

Nepal is 147 181 square kilometers (about 57,000 square miles) in size and in 2011 was home to 26,494,504 people and in 2001 65.6% of the population was involved in agriculture (Ministry of Agriculture Development [MOAD], 2012). Agriculture and forestry contribute 35% to the GDP, more than any other industry (MOAD, 2012). Poultry alone contributes 3.5% of the GDP (FAO, 2014). Nepal is located in south Asia and lies just south of China and north of India (Maps of World [MOW], n.d.). The average per capita income in 2009 was around \$427 (MOW, n.d.). Their major export partners are India Germany and the US of A, Nepal mostly exports grains, leather, clothing and carpets (MOW, n.d.). Only recently Nepal has started exporting poultry products, they exported eggs and broilers to Bhutan (FAO, 2014). Their lack of exporting poultry products is because they were not producing enough eggs and chicken meat for themselves (FAO, 2014). Nepal has more than a 1000 broiler farms and 500 layer farm that directly employ 70,000 people (FAO, 2014). Nepal's poultry sector includes chickens, pigeons, ducks and other birds throughout different production systems (FAO, 2014). Other birds include an ostrich farm that is starting up with 300 birds, also a quail farm reports selling 20,000 quails every 5 months (FAO, 2014). Nepal currently has 98 hatcheries and 111 feed companies supporting the growing market (FAO, 2014). These hatcheries combined produce approximately 1,170,000 broiler chickens per week and 118,200 laying chickens per week (FAO, 2014). Needed to feed the demand for poultry

meat, currently at 150,000 Kg/day (FAO, 2014), and as seen in figure 2, to meet a growing poultry population.

National Poultry Numbers



Source: FAOSTAT, February 2014

Figure 2. Nepal's poultry population is increasing due to a demand for poultry products. Retrieved directly from <http://www.fao.org/3/a-i3964e.pdf>.

Nepal's Poultry Section

There are four poultry sectors in Nepal, industrial, commercial with higher levels of biosecurity, commercial with lower levels of biosecurity and village or backyard (FAO, 2014). Since the Chantecler chicken greatest aspect is its ability to produce eggs in cold climates, it would be most suitable for a village or backyard where there is likely no shelter from the weather. 51.9% of households are involved in keeping chickens in a village or backyard (FAO, 2014). 67.8% of that 51.9%, is in the hills of Nepal, with an average flock size of 5 birds, but that ranges from 2 to 20 birds(FAO, 2014) Backyard chicken farmers produce eggs for their own consumption but also sell extra for cash (FAO, 2014). These backyard chickens produce just short of 94 million eggs (16% of production in Nepal) and 2017 tonnes of chicken meat (13.5% of production in Nepal)

annually (FAO, 2014). Nepal is the 112th largest producer of chicken meat and 92nd largest producer of eggs in the world (FAO, 2014)

The price of eggs, in Nepal, is determined by the Nepal Poultry Egg Producers Association (FAO, 2014). In the last 2-3 years, the price the farmers received for 30 eggs was NR 180-210 (CDN\$ 3.6-4.2) (FAO, 2014). 30-45% of eggs are sold directly by farmers and 25-30% are sold by small grocery stores that bought directly from a farmer. Importing eggs in Nepal is banned, but are occasionally imported illegally from India since they are cheaper to produce in India (FAO, 2014).

Benefits to Nepal

Egg production in a backyard system is average around 40 eggs per year, and meat birds generally takes 6 months before they are ready for slaughter (FAO, 2014). This comes from local breeds like Shakini, Ghanti Khuile, Puwankh Ulte and more (FAO, 2014). Owners of Chantecler chickens have claimed to get 200 eggs per year on this website <http://www.backyardchickens.com/products/chantecler>. This would increase production by 500%. This would result in an additional 376 million eggs for consumption and export. Eggs are also a great source of vitamins A, D and E, folate, Iron, zinc, choline, proteins and omega 3 (Egg Farmers of Canada [EFC], n.d.). A study shows that pregnant women in Nepal were commonly deficient in micronutrients (Jiang, Christian, Khatry, Wu, West, 2005). A study of 1165 pregnant women showed that 12% were deficient in folate, 7% in vitamin A, 14% in vitamin D, 25% in vitamin D, 33% in iron and 61% were deficient in zinc (Jiang et al. 2005). All of these and more can be found in eggs.

Selling Chantecler chickens to Nepalese farmers may interfere with the farmers that are already selling chicks, but this could be avoided by selling Chantecler chickens directly to them as parent stock and letting them breed and sell them. This would mean that we wouldn't be able to sell as many from Canada and would mean less profit for a Canadian farmer but it would make the shipping cost a onetime thing and, over time, would make it profitable.

Shipping costs

Shipping chickens by boat would be a long stressful trip and could very likely lead to heat stress and even possible heat stroke. The engines and the humidity can create too much heat for the animal to bare (Phillips, 2008). Shipping by plane would be much faster and less stressful for the animal. To ship four, day old chicks from the door of Active Life Farm in Londonderry, Nova Scotia to Kathmandu, Nepal it would cost around \$128.87 through Fedex (quote received directly from <https://www.fedex.com/ratefinder/home>). Assuming they are just day olds with an average weight of 40g (Cazaban, 2005) and another 20 grams of feed and shavings. To ship chickens that are already laying (19 weeks of age) and weigh around 4lb would cost over \$500 for just 4 according to Fedex quick quote at <http://images.fedex.com/>. Only 6% of chicken farms have under 250 birds (FAO, 2014), so 94% are paying well over \$31,250 just for shipping. Then the cost of packaging has to be included, which costs \$355 for 60 and can hold up to 10lbs from <http://poultry2.tripod.com/id3.html>. With a max weight of 10lbs, two 19 week old Chantecler chickens can be shipped with food and shavings. For \$740 you can ship 250 birds plus \$31,250 for shipping and then

\$1,250 for chickens (\$5.00 a bird). For a grand total of \$33,240 for 250 birds, this is equal to \$132.96 per bird.

Export Potential

The Chantecler chicken is not an ideal export to Nepal because of many reasons. My consumer base is poor, small subsistence farmers, since the Chantecler chicken is not a majorly productive chicken ideal for intensive farming. The shipping cost, alone is too much for an average small scale Nepalese farmer. This may be avoidable if we can arrange to breed Chantecler chickens in Nepal and only ship enough to start a small flock. The government of Nepal is already working on a poverty alleviation program that provides poor farmers with New Hampshire, and Black Australorp chickens to ensure an adequate nutritional supply to farmers (FAO, 2014). From figure 3, it is evident that the Black Australorp can produce more eggs and equal amount of meat, so the Chantecler chickens would actually be a worse breed. The Chantecler chicken is prominent in cold temperatures but according to Weather Online (n.d.) the temperature only occasionally dips below 0 C, and that's in the nights of December to February. Which barely justifies buying the Chantecler chicken over Nepal's current selection of chickens. Also if their current chickens are stored inside they can create enough heat to keep themselves warm in much colder temperatures. Transporting chickens overseas also make less economic sense if they already have a very similar product in their country. The transport of animals across sea also creates stress for the animals. The heat created by the animals and the motors and the ambient temperature is capable of causing some animals to start sweating and panting (Phillips,

2008). The Chantecler chicken is suited for cold temperatures and would be even less suitable in high temperatures than normal chickens. Chickens bones can easily be broken when they are being caught and are rarely noticed until it reaches the slaughter house (Phillips, 2008). Broken bones cause intense pain to the bird, and the pain increases as the journey distance is increased (Phillips, 2008). Avoiding long distance transport is definitely the humane thing to do, so importing chickens from nearby country like India or China would be preferable.

	Chantecler	New Hampshire	Black Australorp
Eggs per week	4	3	5
Egg colour	brown	brown	brown
Cold hardy	yes	yes	yes
Weight (lbs)	7-8	7-8	7-8
Typical Cost (\$)	5	2.45	2.45
Shipping Cost	\$125/bird	Already in Nepal	Already in Nepal

Figure 3. Statistics acquired from <http://www.mypetchicken.com/chicken-breeds/breed-list.aspx> and shipping cost was acquired from <https://www.fedex.com/ratefinder/home>.

Other possible ideas

Earlier I explained that an elevated cage system would keep the chickens from catching coccidiosis by separating them from other chicken's feces. Low cost chicken cages may be a more suitable export idea since it can last virtually a lifetime and prevent disease outbreaks that would cause financial loss and possibly lead to extreme hunger and malnutrition if they rely on their own chickens for food. A company in China called Alibaba sell poultry equipment including cages that would keep the chickens free of feces and in turn free from coccidiosis. For around 90\$ there is room for 96 chickens and more cages can be easily added to account for more chickens. Since it is already in China transportation would be far more affordable than if it were a Canadian product. This system also ensures that the chickens have a readily available supply of feed and water and makes gathering eggs a lot easier than if they were free run by keeping them all in one area. The down side would be that the chickens could not get nutrients and food from sources like insects and grass and therefore would require more chicken feed. This cage system can be found at http://www.alibaba.com/product-detail/cheaper-laying-hen-cages-for-sale_60333323883.html?spm=a2700.7724857.29.109.6OAU9I.

Outbreaks of HPAI (Avian Influenza) have resulted in Nepal banning the import of poultry animals and products from countries that had outbreaks of the disease (FAO, 2014). Despite the ban, Nepalese people still manage to get poultry animals and products from India, which they do because of the price difference since it is cheaper to raise chickens in India (FAO, 2014). In 2008-2009 over 100,000 day old chicks were seized because they were illegally imported and possible carriers of the disease (FAO, 2014). Thousands of eggs and thousands of kg of poultry meat, were also seized (FAO,

2014). The Avian Influenza is responsible for 1,815,449 birds being killed in 2009-2013 throughout Nepal (FAO, 2014) so every step to reduce the risk of spreading the Avian Flu is necessary. The importing of illegal chickens could be reduced by the use of poultry identification leg bands. These leg bands could be used to identify the country of origin and could prevent the import of day olds, life chickens and life ducks or lead to them being seized sooner. Poultry leg bands may also prevent people from improperly disposing of chickens which can lead to the spread of the disease. More information of poultry leg bands can be found at <http://saknepal.org/resource/poultry-leg-bands/>

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