

Poultry sector country review

REPUBLIC OF YEMEN



Food and Agriculture Organization of the United Nations

**The Structure and Importance of the
Commercial and Village based Poultry Systems
in the
Republic of Yemen**



By

Jamil Abdo Saeed Al – Mamari

**Director, Animal Production Department,
Ministry of Agricultural and Irrigation
Yemen - March 2008**

Table of Contents

	Page
Abbreviations.....	2
List of Annexes	3
Preface	4
Executive Summary.....	5
1. Introduction.....	6
2. General Information about the Republic of Yemen.....	6
3. The current situation of the poultry sector in Yemen	9
4. Poultry production capacity and local needs.....	15
5. Poultry sector predictions for the next 10 years.....	16
6. Marketing and poultry processing.....	17
7. Livestock supporting services.....	20
8. Description of local poultry genetic resources	25
9. Policy and regulatory framework	25
10. Donor funds	26
11. Contingency National Plan to address HPAI	27
12. The proposed integrated National Action Plan for HPAI.....	27
References	31

Abbreviations

# :	Number
AGDP:	Agriculture Gross Domestic Product
AI:	Avian influenza
AREA:	Agriculture Research and extension authority
AV:	Average
BR:	Breed
CVL:	Central Veterinary Laboratory
DGAR:	Directorate General of Animal Resources
DR:	Dependency Ratio
EWARS:	Early Warning and Response
FAO:	Food and Agriculture Organization
FMD:	Foot & Mouth Disease
GDP:	Gross Domestic Product
GNP:	Gross National Product
GoY:	Government of Yemen
HPAI:	High Pathogenic Avian Influenza
HQ:	Head Quarter
IAEA:	International Atomic Energy Agency
Kg:	Kilogram
Km2:	Squarekilometer
LBM:	Live birds markets
MAI:	Ministry of Agriculture and Irrigation
mm:	Millimeter
MoF:	Ministry of Finance
MoPHP:	Ministry of Public Health and Population
NGO:	Non Governmental Organization
OIE:	Office International Des Epizooties
RP:	Rinderpest
RVF:	Rift Valley Fever
SFERA:	Special Fund for Emergency and Rehabilitation Activities
SPFS:	Special Programme Food Security
SU:	Strategic Unit

TAD:	Transboundary Animal Disease
TCP:	Technical cooperation programme
TV:	Television
UK:	United Kingdom
US:	United States of America
USAID:	United States Agency for International Development
USD:	United States Dollar
YER:	Yemen Rial approx. 1 Yemen Rial = 0.005030 US Dollar approx. 1 US Dollar (USD) = 198.825 Yemen Rial
YVMA:	Yemen Veterinary Medical Association

List of Annexes

- Annex 1:** List of commercial poultry farms in Yemen
- Annex 2:** Map of commercial poultry farms in Yemen
- Annex 3:** Images from commercial poultry farms in Yemen
- Annex 4:** Images from poultry marketing in Yemen
- Annex 5:** Images of local chicken from Yemen
- Annex 6:** DGAR Organizational Chart

Preface

The unprecedented widespread outbreaks of Highly Pathogenic Avian Influenza (HPAI) in many countries in Asia, Europe and Africa are continuously asking for rapid and active response on a national, regional and international level. The HPAI crisis has to be addressed worldwide at the source, which is the poultry population. The main danger of the disease lies in the way in which humans interact with and handle the production, distribution, processing and marketing of live poultry and poultry products. The direct and indirect socio-cultural and economic impacts of the HPAI outbreaks influence policy measures and disturb markets, causing the loss of assets. There are strong negative impacts on the livelihoods of rural communities for all producer groups including small holders. Assessment and guidance on measures along the poultry chain for a safe poultry production is therefore of great importance. Specific consideration should be given to strategies and measures that ensure a sustainable pro poor supporting approach and development.

Better understanding of the specific situations of the different poultry sectors and the related market chains will help to develop appropriate control measures and improved biosecurity. It will also help countries that have not been directly affected by the diseases to make necessary preparations. This report describes the structures of the poultry industry in Yemen. It is part of a series of Country Reports that are commissioned by the Animal Production Service (AGAP) of the Food and Agriculture Organization of the United Nations (FAO) for the Socio-Economics And Policy Working Group of the Emergency Centre for Transboundary Animal Disease (ECTAD).

We hope this report will provide accurate and useful information to its readers and any feedback is welcome by the author(s), AGAP and the Socio-Economics And Policy Working Group.

Disclaimer:

The designations employed and the presentations of material in this publication do not imply the expression of any opinion whatsoever on the part of the Food and Agriculture Organization of the United Nations concerning the legal status of any country, territory, city or area or its authorities or concerning the delimitations of its frontiers or boundaries. The opinions expressed are solely those of the author and do not constitute in any way the official position of the FAO.

Author:

Jamil Abdo Saeed Al – Mamari

Director, Animal Production Department, Ministry of Agricultural and Irrigation

Email: Jamil_smamari@yahoo.com

Keywords:

Yemen, poultry production, production statistics, marketing structures, HPAI

Date of publication: March 2008

Executive Summary

The area of Yemen is 555,000 square Km without including the Empty Quarter. Yemen has five agro-climatic zones for agriculture purposes. The climatic conditions vary greatly across the country with rainfall varying from 50 mm in the coastal lowlands to 1200 mm in the southern upland. The climate of Yemen is hot-wet on the coastal strip, moderate in the uplands and is desert climate in the eastern zone. Administratively Yemen is divided into 21 governorates including the capital (Sana'a city). The population of Yemen is 20,900,532 with a growth rate of 3.02 percent. The rural population in Yemen is about 71 percent of the total population and 79 percent of the rural families work in the livestock sector, which represent 1,494,000 rural families where women are responsible for about 90 percent of the total work in animal husbandry.

The poultry sector in Yemen is considered as one of the biggest investments in the country and the main investment in the field of livestock. The investment is estimated to be more than \$1.5 milliards USD. The average annual growth rate in the poultry production has been about 7 percent caused by increasing demand for poultry meat, which is less expensive than red meat. The total annual meat consumption, both for red meat and poultry meat is estimated at about 371,500 tons, with a share from poultry meat of about 251,500 tons. This means that the poultry sector supplies 67.7 percent of the meat consumption. The local poultry production covered 50.3 percent (3.4 percent estimated from the backyard local chickens) of the needs and the rest is imported as frozen chickens.

A survey that was implemented in 2006 for the first time in the country revealed that there are 1566 poultry commercial farms with 3282 sheds. It also revealed that the annual poultry populations was 126 225 000 broilers, 5 110 000 layers and 1, 663,400 breeders for both broilers and layers. The indigenous chickens are estimated at 10,255,000 chickens. There is one manufacture for producing veterinary drugs and disinfectants, about 62 feed mills, 14 hatcheries, two poultry slaughterhouses (not operational) and 2182 slaughtering shops.

The highest density of the poultry industry is found in the highlands but all hatcheries are located in the lowland of Tihamah Zone, the costal part of the country. All commercial production system in the country can be categorizes as sector 2 and 3 and the village backyard chickens are all within the 4th sector. Big companies produce about 65 percent of one-day old chicks, 30 percent of table eggs and 10 percent of broilers, while middle size producers or farms produce about 35 percent of one-day old chicks, about 50 percent of the table eggs and about 60 percent of poultry meat (broilers). The small producer's/ farmers contribute with producing about 20 percent of table eggs and 30 percent of poultry meat (broilers).

1. Introduction

Animal resources sector play an active role in the national economy as it is estimated that the livestock contributes with 23.3 percent of the total local agriculture production (the poultry production is about 8 percent). The rural population in Yemen is about 71 percent of the total population, 79 percent of the rural families work in livestock sector, which represent 1,494,000 rural families where women are responsible for about 90 percent of the total work in animal husbandry (F.M. Qassim, 2003 – 2006, facts and figures about agriculture sector). As human population increases by 3.02 percent annually, which is a high rate compared to the average growth of production capacity of animal products, the share of Yemeni person/year from local animal products becomes very limited: Red meat 3.8 kg, White meat 6 kg, 48.9 table eggs.

The increasing demand of the people for the poultry meat attracted investors to invest in this sector. Therefore late eighties the hatcheries and breeders of broilers were introduced into the country. A survey that was implemented in 2006 revealed that, the poultry commercial farms are 1566 and consist of 3282 sheds. It also revealed that the annual poultry population was 126,225,000 broilers, 5,110,000 layers and 1,663,400 breeders for both broilers and layers. The indigenous chickens were estimated at 10,255,000. No duck rearing is practiced in Yemen. It is estimated that there are more than 400,000 persons working in the poultry sector and its related activities and around 1.200,000 rural families' rearing backyard chicken. There is one manufacture for producing veterinary drugs and disinfectants, about 62 feed mills, 14 hatcheries, two poultry slaughterhouses (not working) and 2182 slaughtering shops.

2. General Information about the Republic of Yemen

The republic of Yemen is situated in the southern part of the Arab Peninsula – Southwest Asia. It is bordered from north by Saudi Arabia, from the South Arabian See, from the East Sultanate of Oman and from the West by the Red See. The area of Yemen is 555,000 square km without considering the Empty Quarter. Considering agriculture purposes Yemen has five agro-climatic zones. The climatic conditions vary greatly across the country with rainfall varying from 50 mm in the coastal lowlands to 1200 mm in the southern upland. The five agriculture zones are:

- Eastern zone – dry desert area including the Empty Quarter
- Coastal lowland – the length of the coast is about 2100 Km
- Central and northern highland Northern highlands -
- Southern uplands
- Islands – these are scattered on the Arabian and Red Sees and Soqatra and Kmaran Island are the most important islands in Yemen.

The climate of Yemen is hot-wet on the coastal strip and moderate in the uplands and in the eastern zone is desert climate. Administratively Yemen is divided into 21 governorates including the capital (Sana'a city).

The population of Yemen is 19,685,161 according to the 2004 Census with a growth rate 3.02 percent. The population of Yemen is not evenly distributed and the average density is 45 persons per square km. For more details see tables (1-8).

The Structure and Importance of the Commercial and Village based Poultry Systems in Yemen

Table 1: Population estimates (2003 – 2006) by gender			
Years	Male	Female	Both
2003	9 608 910	9 232 090	18 841 000
2004	10 036 953	9 648 208	19 685 161
2005	10 344 249	9 938 695	20 282 944
2006	10 661 838	10 238 694	20 900 532

Source: Statistical year book 2006

Table 2: Resident population by urban & rural categories from 2003 – 2006				
	2003	2004	2005	2006
Urban	5 482 310	3 423 518	5 637 756	6 070 613
Percentage	29.9 %	23.5%	28.6%	29.05%
Rural	12 799 727	11 164 289	14 074 405	14 829 919
Percentage	70.11%	76.5%	71.4%	70.95 %

Source: Statistical year book 2006

Table 3: Resident population in 2004 by age groups and projections for 2005 – 2006			
Age groups	2004	2005	2006
0 – 4 years	2 938 147	3 027 372	3 119 553
	14.92%	14.92%	14.92%
5 – 9 years	3 054 564	3 147 327	3 243 164
	15.51%	15.51%	15.51%
Younger than 15 years	8 866 993	9 136 291	9 414 513
	45%	45.04%	45.04%
15 – 64 years	10 143 388	10 451 377	10 769 568
	51.5%	51.52%	51.52%
Older than 65 years	674 780	695 75	716 452
	3.4%	3.42%	3.53%

Source: Statistical year book 2006

Table 4: Age Dependency Ratio for population		
Kind /Years	Census 1994 (%)	Census 2004 (%)
For children (Age 0 – 4)	108.9	87.4
For Age 65+	7.7	6.7
For children & Age 65+	116.6	94.1
Total dependency ratio	216.6	194.2
Age Average	20.6	21.9
Age ratio	13.9	15.6

Source: Statistics Year book 2005

The Structure and Importance of the Commercial and Village based Poultry Systems in Yemen

Table 5: Ratio of illiteracy among the population (>10 years) according to the labor force survey 1999			
Sex	Urban	Rural	Total
Male	15.4%	31.1%	23.2%
Female	40.5%	75.7%	58.1%
Both	27.9%	53.4%	40.6%

Source: Statistics Yearbook 2006

Table 6: Rate of education enrollment at primary school level						
Sex	Net enrollment Rate (%)*			General enrollment Rate (%)**		
	Urban	Rural	Total	Urban	Rural	Total
Male	30.0	27.3	28.6	99.2	85.6	92.4
Female	18.4	8.1	13.2	91.3	44.7	68
Both	24.2	17.7	20.9	95.2	65	80.2

* General enrollment rate: the total number of people recorded for education
 ** Net enrollment rate: the actual number of people who remain in schools

Source: Statistical Yearbook 2003

Table 7: Rate of education enrollment at preparatory and secondary school level												
Sex	Preparatory school						Secondary school					
	Net enrollment Rate (%)			General enrollment Rate (%)			Net enrollment Rate (%)			General enrollment Rate (%)		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
Male	21.0	18.5	19.7	105.5	83.0	94.3	39.3	27.2	33.2	79.5	51.6	65.5
Female	18.4	8.1	13.2	83.1	27.8	55.5	34.1	6.6	20.3	63.9	10.8	37.3
Both	19.7	13.3	16.4	94.3	56	74.4	36.8	16.9	26.8	72	31.2	51.5

Source: Statistical Yearbook 2004

Table 8: Life expectancy at birth estimates for years 2001 -2006			
Sex	Urban	Rural	Total
Male	60.31	60.11	60.2
Female	62.70	61.76	62.2
Both	61.5	60.9	61.2

Source: Statistical year book 2006

The statistical analysis shows that the population of children under the 5-years of age is large with 3 119 553 for both sexes and combined with the low income of the majority of Yemeni families (see Table 9) this leads to low nutrition of children under the 5 years of age and can be the main cause of deaths. Tables 10 and 11 indicated the mortality rate among children and infants.

Table 9: Average rate per capita from GDP & GNP for duration period 2003 -2006					
	Value	2003	2004	2005	2006
Average GDP/capita	Rial	146 760	132 034	158 179	182 402
	USD	625	715	826	921
Average GNP/capita	Rial	105 350	119 911	143 602	171 252
	USD	574	649	750	869
Average AGDP/capita	Rial	13 083	13 598	14 614	16 419
	USD	71	74	76	83

Source: Facts and numbers about agricultural Sector in Y.R 2006

Table 10: Mortality Rate for children less than 5 years			
Sex	Urban ‰	Rural ‰	Total ‰
Male	91.75	93.32	92.5
Female	86.67	93.68	90.1
Both	89.21	93.5	91.3

Source: Statistical Yearbook 2006

Table 11: Mortality Rate for infants			
Sex	Urban ‰	Rural ‰	Total ‰
Male	78.22	79.45	78.83
Female	71.33	76.55	73.94
Both	74.77	78.00	76.38

Source: Statistical Yearbook 2005

3. The current situation of the poultry sector in Yemen

The commercial poultry sector in Yemen started late in the seventies of the last century with some poultry farms, which completely relied on the importation of everything, starting from the one-day old chicks to ready feed etc. Because of this reason the Government of Yemen (GoY) established a strategy to develop the poultry sector in the country. This started in the eighties with foreign assistance to establish a training centre specific for training farmers and interested persons on the different poultry activities and attached to it was a poultry demonstration farm. At the same time layer chickens were distributed to the interested farmers and families from this farm. Later on a special project for poultry development was initiated (1985-1992) through assistance from the Netherlands. This project offered all services to the sector free of charge including field visits, lab diagnosis and all other related activities to the sectors. In addition the GoY established "Marib Poultry Company" as a mixed investment from local and Arab investors. This company distributed chicks to the farmers and offered them veterinary services while at the same time it distributed 16-weeks old layers to those families who were interested and produced table eggs for local consumption. At the same time GoY encouraged local and the Arab investors to invest in the field of poultry. In addition the increasing demand of the people for poultry meat attracted investors to invest in this sector.

The Structure and Importance of the Commercial and Village based Poultry Systems in Yemen

Currently the poultry sector in Yemen is considered as one of the biggest investments in the country and the main investment in the field of livestock, the investment is estimated to be more than \$1.5 milliards USD. Poultry production has been increasing over the last decade, and the annual average growth rate in the poultry production has been about 7 percent with increasing demand for the poultry meat, which compared to red meat is less expensive and most of the families can afford the price. The total meat consumption (both red and poultry meat) is estimated at about 371,500 tons per year, of which poultry meat has a share of about 251,500 tons. This means that the poultry sector supplies 67.7 percent of the meat consumption. The local poultry production covered 50.3 percent (3.4 percent estimated from the backyard local chickens) of the needs and the rest is imported as frozen chickens.

A survey that was implemented in 2006 for the first time in the country revealed that, there are 1566 poultry commercial farms with 3282 sheds. It also revealed that the annual poultry populations was 126 225 000 broilers, 5 110 000 layers and 1 663 400 breeders for both broilers and layers. The indigenous chickens are estimated at 10 255 000 hens. There is one manufacturer for producing veterinary drugs and disinfectants and about 62 feed mills, 14 hatcheries, two poultry slaughterhouses (not operational) and 2182 slaughtering shops. For more details see the Table 12-16.

Table 12: Population of commercial poultry					
	Poultry Population				
	2003*	2004*	2005*	2006	2007*
Broiler Breeders	1 128 125	1 187 500	1 250 000	1 375 000	1 500 000
Layer Breeders	113 135	115 444	117 800	124 000	163 400
broiler	116 472 510	118 849 500	121 275 000	123 750 000	126 225 000
Layers	4 430 000	4 540 000	4 654 000	4 884 000	5 110 000
Total	122 143 770	124 692 444	127 296 800	130 133 000	132 998 400

* Estimated Source: commercial poultry farm survey 2006

Table 13: Number of indigenous chicken				
2003	2004	2005	2006	2007
9,088,000	9,369,000	9,658,000	9,956,010	10,255,000

Source : Estimated by the Directorate of Animal Production

The Structure and Importance of the Commercial and Village based Poultry Systems in Yemen

T

Table 14: Distribution of commercial poultry farms by Governorates						
Province	Census 2006			Estimate 2007*		
	Farms	Sheds	Share (%)	Farms	Sheds	Share (%)
Ibb	274	563	17.15	284	560	16.25
Taiz	267	507	15.44	278	530	15.40
Sana'a	209	463	14.10	214	481	14.10
Sadah	74	364	11.00	79	382	11.00
Dhamar	256	351	10.70	261	368	10.70
Amran	221	307	9.40	225	322	9.34
Al - Beida	85	196	6.00	89	206	6.00
Sanaa City	71	194	5.97	72	204	6.00
Hodeidah + Raimah	49	115	3.50	53	121	3.51
Al- Daleh	31	72	2.20	34	75	2.11
Lahj	11	71	2.16	11	74	2.14
Hadhramout	4	34	1.00	4	40	1.16
Al-Mahwit	7	24	0.73	7	27	0.80
Hajjah	6	14	0.42	6	9	0.30
Abyan	1	7	0.22	1	16	0.50
Total	1566	3282		1618	3415	

* Estimated from the actual census in 2006 and using questionnaires of veterinarians for same farms in 2007.

Source : Commercial poultry farm survey, 2006

Table 15: Distribution of poultry farms by districts			
Governorates	Districts	# of Farms	# of sheds
Ibb	Yarim	90	222
	Al- Radamah	40	76
	Ibb	20	30
	Al-Odin	7	15
	Al- Hazm	4	10
	jeblah	7	13
	Al-Saini	24	69
	Al-Makhader	31	50
	Al-Sahol	14	21
	Hobish	11	15
	Dhi sofal	14	27
Al-Qada	6	15	
Subtotal Ibb		274	563
Taiz	Al-Dabab	15	20
	Al-Mesrakh	3	4
	Al-Maafer	16	22
	Al-Shamiten	6	24
	Al-Taiziah	126	256
	Khader	67	113

The Structure and Importance of the Commercial and Village based Poultry Systems in Yemen

Table 15: Distribution of poultry farms by districts			
Governorates	Districts	# of Farms	# of sheds
	Al-maoadem	26	48
	Al-Ganadeah	7	20
Subtotal		267	507
Sana'a Gov.	Sanhan	67	142
	Mnakhah	5	8
	Bani Hoshish	13	28
	Bani Mater	14	37
	Hamdan	33	113
	Belad Al-Ros	11	11
	Gehana	66	124
Subtotal		209	463
Sa'dah	Al-Safra	38	169
	Sahar	29	162
	Magaz	7	33
Subtotal		74	364
Dhamar	Al-Sharq City	17	34
	Otomah	5	6
	Gahran	27	74
	Dhoran	3	4
	Al-Manar	6	6
	Ans	80	159
	Al-Hada	3	6
	Dhamar	15	62
Subtotal		156	351
Amran	Raidah	17	30
	Kharef	25	58
	Khamer	18	31
	Debeen	34	43
	Aeal Yazed	11	11
	Aeal Soraeh	64	64
	Amran	18	18
	Harf Sofean	21	28
	Bani Al-Monabeh	13	24
Subtotal		221	307
Albaida	Al-Baida	31	86
	Al-zhara	12	22
	Qaeda	20	29
	Al-Sharbah	4	15
	Al-Arsh	6	11
	Radaa	12	33
Subtotal		85	196

The Structure and Importance of the Commercial and Village based Poultry Systems in Yemen

Table 15: Distribution of poultry farms by districts			
Governorates	Districts	# of Farms	# of sheds
Sana'a (Capital)	Bani Al-Hareth	58	162
	Al-Sabeen	9	14
	Al-Hataresh	3	13
	Moaeen	1	5
Subtotal		71	194
Alhodayedah/ Raimah	Baet Al-Faqeh	31	81
	Bagel	14	21
	Zabeed	1	1
	Al-Khokha	1	2
	Al-Garahi	2	10
Subtotal		49	115
Aldhale'	Al-Dale'	6	20
	Al-Haseen	5	10
	Qoatoba	3	9
	Damet	17	33
Subtotal		31	72
Lahj	Al-Malah	11	71
Hadramout	Hadramout	4	34
Almahweet	Al- Ttawelah	1	3
	Al-Mahweet	2	7
	Al-Khabt	1	3
	Bani Saad	4	11
Subtotal		7	24
Hajjah	Al-Shahel	1	3
	Al-Mahabsha	1	4
	Abes	3	3
	Hajjah	1	4
Subtotal		6	14
Abyan	Khanfar	1	7
Grand Total		1566	3282

Source : Commercial poultry farm survey, 2006

Table 16: Commercial poultry farms by type of production						
Governorate	Farms	Sheds				
		Breeder Layers	Breeder Broilers	Broiler	Layers	Total
Ibb	274	8	24	273	258	563
Taiz	267	—	61	383	63	507
Sana'a	209	—	45	338	80	463
Sadah	74	—	—	359	5	364
Dhamar	256	4	60	180	107	351
Amran	221	—	19	282	6	307
Al - Beida	85	10	27	93	66	196
Sana'a City	71	5	5	103	81	194
Hodeidah + Raimah	49	—	—	110	5	115
Al- Daleh	31	—	10	60	2	72
Lahj	11	—	—	71	—	71
Hadhramout	4	—	—	34	—	34
Al-Mahwit	7	—	4	20	—	24
Hajjah	1	—	—	7	—	7
Abyan	6	—	—	10	—	14
Total	1566	31	255	2323	673	3282

Source : Commercial poultry farm survey, 2006

Structure of the Poultry Sector

The highest density of the poultry industry is found in the highlands starting from the southern uplands of Taiz and Ibb, where the majority of breeding farms are to the central highlands of Ibb (Yarim), Albayeda, Dhamar and Sana'a, where the majority of layers and then the northern highlands of Amran, some parts of Hajjah and Sa'dah, where the majority of broilers are. However, all hatcheries are located in the lowland of Tihamah Zone, the costal part of the country (see distribution map annex -1 and Annex (2) and Annex (3).

The FAO methodology for categorizing of poultry production system is not valid in Yemen, as all commercial production system in the country can be categorized as sector 2 and 3 and the only village backyard chickens is within the sector 4. Therefore to ease the description of the poultry production system in Yemen the DGAR uses the following categories:

1. **Big producer companies:** There are more than 7 big companies that own hatcheries, breeding farms (parent stock) and others facilities to make the feed and sell it to the other farmers. The size of each company or farm vary, they may own more than 50000 parent stock (mainly broilers) or/and more than 200 000 (some farmers own up to 450 000 layers. The broilers farms in this category have usually more that 25 000 broilers. These big companies produce around 65percent of the one-day old chicks, 30 percent of table eggs and 10 percent of the broilers.
2. **Middle producer companies or farms:** There are more than 25 of these companies or farms for rearing broilers and table eggs production. Some of the

middle companies or farms own breeding farms (Parent stock). The size of the farm can be 5 000 to 20 000 parent stock mainly layers parents, more than 50 000 up to 200 000 layers and more than 10 000 broilers. This type of production produces around 35 percent of one-day old chicks, about 50 percent of the table eggs and about 60 percent of poultry meat (broilers).

3. **Small producer's farmers:** They do not own any parent stock, but the farmers of this category may own from less than 5 000 up to 50 000 layers. In this category fall also those farmers who may own less than 10 000 broilers and some farmers may own yards with 500 to 1 500 heads and they are mostly in the hot costal areas in Tihamah, Hadramount and other areas with hot climate. This category is responsible for producing about 20 percent of table eggs and 30 percent of poultry meat (broilers).
4. **Backyard type of poultry rearing:** This category includes all indigenous chickens that are reared by village families. It is estimated that the overall population of this type is around 10 millions heads of indigenous chickens. Most of the families are keeping backyard chickens for their own use, few families are those who sell chickens to the markets in particular those close to the cities.

The raw materials for the poultry feed is 100 percent imported (see Table 17) and the feed is then prepared in the country by grinding and mixing and packing it in 50 kg packages. Big and some middle farmers have their own machines, while some middle and small farmers purchasing their feed from those companies or farmers, where also they get one-day old chicks, vaccines, drugs and veterinary services.

Table 17 : Raw feed material imported for the Poultry Sector (ton)				
Year	Materials			
	Maize	Soybean	Concentrate	Additive feed
2003	235 000	65 000	36 000	900
2004	250 000	70 000	38 000	1 000
2005	255 000	75 000	40 000	1 100
2006	280 000	90 000	42 000	1 300
2007	300 000	100 000	45 500	1 500

Source: Agricultural statistical Yearbook 2006 & DGAR information for 2007

4. Poultry production capacity and local needs

The production of the poultry sector includes poultry meat (broilers), table eggs and hatching eggs. The production of local commercial hatching eggs can cover the local needs for the day-old chicks including both broilers and layers, but sometimes, when large breeding stocks either at the end of the production period or out of the production, the hatching eggs are imported to cover the demand of the market. However, poultry meat that is produced locally can cover only 50.7 percent of the local needs, while the production of table eggs covers all the local needs (See Tables No. 18, 19 and 20). The total local consumption of poultry meat and table eggs is shown in the table No. 21.

Table 18: Production of table and hatching eggs (in millions)					
Type	2003	2004	2005	2006	2007
Commercial table eggs	890	908	930	976	1,022
Local table eggs	27	28	29	30	31
Hatching eggs for commercial broiler	124	131	138	151	165
Hatching eggs for commercial layer	9	9	9	10	11
Hatching eggs for local broiler and layer	55	57	85	60	62
Total	1,105	1,132	1,191	1,227	1,291

Source: Agricultural Statistical Yearbook 2006 and DGAR information for 2007

Table 19: Production of poultry meat (Mt)					
Type	2003	2004	2005	2006	2007
Commercial white meats	108,800	110,976	113,195	117,723	122,200
Share of commercial	96.6%	96.6%	96.6%	96.6%	96.6%
Local white meats	3,800	3,900	4,000	4,200	4,300
Share of local	3.4%	3.4%	3.4%	3.4%	3.4%
Total	112,600	114,876	117,195	121,923	126,500

Source: Agricultural Statistical Yearbook 2006 and DGAR information for 2007

Table 20: Import of frozen meat, hatching eggs and one-day old chicks					
Type	2003	2004	2005	2006	2007
Frozen white meat (Mt)	118,900	99,700	114,900	120,000	125,000
Broiler hatching eggs	2,294,568	486,720	----	2,954,724	----
Life layer chicks	----	6002	112,040	179,426	----

Source: Agricultural Statistical Yearbook 2006 and DGAR information for 2007

Table 21: Local consumption of poultry meat and table eggs					
Type	2003	2004	2005	2006	2007
White meat (000) ton	231,5	214,6	232	241,9	251,5
Table eggs (000000) eggs	913	936	959	1,006	1,053

Source: Agricultural Statistical Yearbook 2006 and DGAR information for 2007

5. Poultry sector predictions for the next 10 years

As the annual poultry sector growth is around 7 percent, it is expected that the poultry sector will grow during the next 10 Year with an average 10 percent. Therefore the poultry meat production can be increased up to 253,000 ton approximately and table egg production up to 1,684,800,000 eggs. In addition it is expected that the hatching eggs for both broilers and layers will be covered by local production.

Poultry sector trend estimated through the next 10 years: The poultry sector plays integral part of national food security, which covered about 50.3 percent of the white

meat consumption in Yemen, so that the government of Yemen encourage the national and regional investment in livestock sector in particular the investment in poultry sector.

Expected poultry sector changes during the next 10 years: The population growth rate in Yemen is around 3.2 percent, and the human population will thus increase during the next 10 years to 30 millions. This will lead to increased demand for the animal protein and price increase of animal products, which will lead to some changes in the consumption behaviors of the people. Therefore the demand for the frozen meat will increase and this makes investment in local poultry slaughterhouses more profitable. Moreover, the processing of by products that is related to slaughterhouses will be developed.

6. Marketing and poultry processing

The poultry marketing chain is an important infrastructure for either promoting or breaking the HPAI virus infection chain and that of other infectious poultry diseases.

The marketing of poultry products in Yemen is governed by the consumer habit of selecting live poultry at the market and have these *halal*-slaughtered at the time of purchase. In spite of this habit, dressed, frozen poultry is imported from Brazil and France for the hotel and restaurant trade in the larger cities. Also due to the high price of live local chicken, the poorer people nowadays are starting to consume this kind of dressed poultry. The poultry market chain begins with middlemen who purchase broilers and table eggs directly from the producer and transport these in woven or plastic cages, and in carton-packed egg trays, to the city and town markets. Individual producers will sometimes market their poultry directly to these markets without an intermediary. From the wholesale markets, and occasionally directly from the farms, broilers and eggs are distributed by a second tier of middlemen to city poultry shops or to smaller village markets. Poultry slaughtering is therefore decentralized, making consumer biosafety and hygienic poultry handling a difficult task. For example, Sana'a City has one new wholesale market supplying about 340 poultry shops in the city, and neighboring smaller towns and surrounding villages with daily turnover sales of more than 100,000 chickens (see Annex 4). In the villages, households purchase live poultry from their local markets or take them from their own flocks, and slaughter these at home.

The constant intermingling of middlemen, poultry and water trucks, poultry and egg transport crates between farms, live-bird markets, poultry shops and consumers, with scant attention paid to biosecurity and hygienic poultry handling, presents a formidable challenge in trying to break virus infection chains.

In Yemen there is no processing of the poultry products. The slaughtering shops owned by individuals in the cities and towns do the slaughtering of the poultry and in the villages families practice slaughtering in particular by their housewives. There are two modern poultry slaughterhouses, one is private and the other one is shared ownership by the government, cooperative and private sector and both of them are still not working. The first one (the private) is owned by Alfah Company and situated in Dhamar Governorate and it has a production capacity 5000 heads per hour. The

second (Shared Property) is situated in Ma'bar district, governorate of Dhmaer and its production capacity is 7000 heads per hour. Both slaughterhouses are licensed by the government (Annex 5).

Marketing of poultry has some constraints. These constraints, which effect the development of poultry markets, can be as following:

- Monopoly of production facilities by big poultry companies. These companies are producing one-day old chicks, feeds (prepared from 100 percent imported primary materials), medicines and vaccines and also veterinary services and other related needs such as poultry farm equipments ...etc.
- High prices of the above mentioned poultry inputs can dramatically affect the small farmers who are responsible for about 30 percent of broiler and 20 percent of table eggs production.
- The big companies in addition to producing one day old chicks and monopolizing other related needs produce also broilers and table eggs in big quantities. These make unfair competitions with the small producers, which lead to investment losses of small farmers.
- Due to lack of modern slaughtering poultry houses and because the marketing chain is not efficient to cover the whole country and difficult roads, the farmers suffer from the big losses due to overproduction in some seasons of the year.
- The prices of the live poultry and table eggs are different form one site to the other according to the supplies and demand of the market and also the distance of the market form the production site can play a role in the prices. The average retail and wholesale prices of live poultry and table eggs for the period 2003-2007 are shown in the Tables 22 and 23, respectively.
- Marketing can be influenced by seasonal variations in consumption patterns, which change during the religious events. For example during the Ramadan holy month the consumption of poultry meat increases and that of table eggs decreases. In addition during the Alhij (religious EID) people consume more red meat then white meat. On the other hand during the school vacation the consumption of table eggs can be decreased. The consumption of table eggs is in general lower during the summer time.

The Structure and Importance of the Commercial and Village based Poultry Systems in Yemen

Table 22: Average retail price of live poultry and table eggs by month (2003-2007)										
Year / Month	Poultry price/chicken/ YER*					Table eggs/YER for one box**				
	2003	2004	2005	2006	2007	2003	2004	2005	2006	2007
Jan	388	370	400	450	500	355	350	420	475	500
Feb	350	375	363	450	520	350	370	410	475	500
Mar	325	400	375	470	520	370	370	400	500	510
Apr	292	400	373	430	530	370	400	400	520	520
May	331	400	385	425	480	360	400	400	520	515
Jun	338	400	385	410	490	350	400	400	510	520
Jul	317	380	425	440	470	350	400	420	530	500
Aug	281	370	425	450	480	380	400	430	550	500
Sept	306	350	500	460	490	390	400	450	530	505
Oct	294	410	450	500	500	400	420	420	510	510
Nov	306	440	470	500	500	420	450	420	500	500
Dec	319	430	500	510	490	400	420	430	500	515
General average	321	394	424	458	498	374	398	417	510	508

*The unit is one live chicken. The average weight for one chicken is around 1 kg
** Box of table eggs = 30 eggs

Source: Agricultural Statistical Yearbook 2006 and marketing report

Table 23: Average wholesale price of live poultry and table eggs by month (2003-2007)										
Year / Month	Poultry price/chicken/ YER*					Table eggs/YER for one box**				
	2003	2004	2005	2006	2007	2003	2004	2005	2006	2007
Jan	358	345	380	430	482	320	305	380	445	465
Feb	320	354	345	430	500	325	336	380	445	463
Mar	300	380	355	452	500	340	334	370	465	485
Apr	262	380	353	410	510	340	470	370	480	485
May	306	380	365	407	460	330	370	365	480	480
Jun	363	385	400	390	472	310	365	360	485	480
Jul	397	365	405	418	450	310	370	375	490	465
Aug	260	350	405	425	458	345	365	390	525	470
Sept	281	328	426	441	470	350	365	410	500	475
Oct	270	390	429	482	480	365	380	390	480	475
Nov	286	416	448	482	480	390	415	385	475	470
Dec	294	411	480	490	470	360	390	390	470	480
General average	300	365	399	438	478	341	372	380	478	474

*The unit is one live chicken. The average weight for one chicken is around 1 kg
** Box of table eggs = 30 eggs

Source: Agricultural Statistical Yearbook 2006 and marketing report

7. Livestock supporting services

The Ministry of Agriculture & Irrigation consists of two main sections, Irrigation and Agriculture Affairs. The Ministry is headed by the Minister of Agriculture and assisted by a Deputy Minister, and two Assistant Deputy Ministers, one Assistant Deputy for Irrigation Affairs and the other one for Agriculture Affairs. The Directorate General of Animal Resources (DGAR) is responsible to the Minister of Agriculture and Irrigation through the Assistant Deputy Minister for Agriculture Affairs and Deputy Minister. It is headed by the Director General and consists of four departments, Animal Health, Central Veterinary Laboratory (CVL), Animal Production (this consists of 3 sections: poultry sections, livestock production section & feed section) and General Services (for more detail see organizational chart in Annex 6). However, in practice the livestock activities have been almost entirely concentrated on developing an effective professional veterinary service, while other departments within DGAR are poorly staffed and are consequently not capable of carrying out the wide range of responsibilities assigned to them. Moreover the budget which is allocated for DGAR is essentially for the veterinary services (for national campaigns including survey, surveillance and for minor laboratory equipments and consumables related to the campaigns).

Since the year 1992 when a Dutch Poultry Project ended, the poultry sub-sector was left without government intervention either positively or negatively except some diagnostic service from the laboratory, which totally depends on the availability of the reagents. There were very few occasions when the Government helped the sector, this was during the Newcastle Disease outbreak, Infectious Bronchitis and as well as during the dioxin crises in late nineties of the last century. However, since the Avian Influenza crises started worldwide in the year 2003/2004, the government is strongly involved in the surveillance and health status control of the poultry in the country. Moreover, all importation of poultry feeds, drugs, vaccines and other poultry needs are controlled by the DGAR through the importation licensing and quarantine control. In addition there are not enough trained poultry specialist within the veterinary public sector except two at the CVL and one field experienced veterinarian who moved recently from the private poultry sector. However, recently a poultry section was formed within the Animal Health Directorate, responsible for the Poultry Health Status.

Because of the nature of poultry industry in Yemen as a private business with little intervention from the government in the field of veterinary services, the sector built up its own veterinary service, where the big company/big farmers provide the farmers with one – day old chicks and also supply them with feed, vaccines and needed drugs. At the same time these big companies control the farm health status of their clients through their veterinary staff by regular visits to the farm sites or by reacting on the reports from the farmers.

There is a General Poultry Association of the Poultry Producers & Marketers, which is under the umbrella of the Agriculture Cooperative Union, but not all the poultry producers or marketers are members of this Association. However, only members of the Association can benefit from its facilities (The association offers some services for its members such as buying raw material of poultry feed, grind it and sell it to its members at a less price). In addition, there is an Association of Consumer Protection.

The Structure and Importance of the Commercial and Village based Poultry Systems in Yemen

The Yemen Veterinary Medical Association (YVMA) is one of the young NGOs, which was formed in 1997; almost all veterinarians from both public and private sectors are members of this Association (approximately 185 members).

The table below shows the number of veterinarians, veterinary technicians and other livestock specialists:

	# of personnel	Notes
Veterinarians:		
1. Government staff		
- Ministry of Agriculture	72	
- Provisional & Technical Education	14	
- Slaughterhouses and environment Health Dep.	28	
- Universities	41	
Sub-total	155	
2. Private Sector		
In poultry sector	30	
Large animals	2	
Total of the Veterinarians	187	
Technicians:		
1. Government (Ministry of Agriculture and Slaughterhouses)	297	
2. Private Sector	70	
Sub-total of the technicians	367	
Laboratory staff		
Laboratory technicians – CVL	14	6 of them with university degree.
Regional Laboratories	6	2 with university degree in science
Private Vet Laboratories	3	Technicians
Animal production specialists:		
Government	120	
Private sector	25	Needs revision
Subtotal of Animal production specialists	145	

The veterinary services are lead by the Directorate of Animal health and consists of the central veterinary services, which are officially responsible for the disease control network, quarantine network, licensing for importation of inputs (with participation of Directorate of Animal Production) of the livestock sectors including poultry (feed, drugs, vaccines and other related inputs) and also licensing for importation of live animals and animal products including one-day old chicks, hatching eggs and frozen

poultry. The DGAR is also issuing the health certificates for exports purposes. Field section exists within the Department of Animal Health. This section by its tasks is responsible for collecting reports from the veterinary field centers throughout the country and follow up the vaccination programmes, but the section lacks qualified veterinarians, who can manage well the field information and interpret them on the benefit of the veterinary services. The other section within the animal health department is the extension section. This section is responsible for preparing extension materials/ messages that are related to animal health including messages, which create the awareness of the farmers to the particular disease that targeted by the veterinary services. Lack of veterinarians and veterinary technicians has a negative effect on production and causes unnecessary stock losses. The more remote areas have no easy access to veterinary help. Most drugs are available on the open market but some are out of date and may well be misapplied.

A Strategic Unit (SU) was established within the Department of Animal Health, with the core responsibility of this unit being the disease surveillance and formulating strategies for disease control. This unit leads the network of surveillance in the country; it succeeded to establish surveillance centres in some governorates and is looking forward to establish other centres in other governorates in the near future. During the Technical Cooperation Project sponsored by FAO, that ended in 2003, the Strategic Unit was significantly strengthened during the project through major support for information technology, both hardware and software and training in their use. The SU now has a strong central unit plus five zonal offices and should be able to provide detailed analysis of all disease reports and investigations in Yemen, and to underpin the process of disease surveillance required to follow the OIE guidelines related to animal disease control including RP, RVF, FMD,.... etc. Experience gained during the RVF outbreak should also have improved its capabilities of dealing with other new disease emergencies that may arise in Yemen.

The field extension, which was successful in past, has been transfer to the AREA (Agricultural Research and Extension Authority). In 2004 a General Directorate of Agriculture Extension and Media was established by ministerial decree. Unfortunately, the responsibility of field extension was given to other authorities, although this kind of extension is not a result of new research, but is a part of daily communications between the veterinarians and/or field livestock specialists who belong to the DGAR. Although it is suggested here that veterinary issues are not the main reason for poor livestock performance, the GDAR is poorly funded and requires strengthening from a national disease prevention and epidemiological standpoint. Moreover, the scarce finances have severely constrained the provision of effective veterinary services to livestock farmers in many areas. This is a logistical, organizational and practical impasse that can only be improved by finding a balance between financial inputs from public and, when appropriate, private sector resources.

The Central Veterinary Laboratory CVL in Sana'a was built in the 1970th with help of the British Government. It comprises several old buildings and carries out the major load of veterinary diagnostics in the fields of bacteriology, helminthology, hematology, pathology and virology. Equipments are sufficient to run basic diagnostics with basic technology. CVL was technically supported by IAEA through TCPs, where it received some equipment, expert visits and training for the personals that allow the CVL to take over some serological tests with competence abilities.

Moreover, the CVL was equipped by IAEA to test for veterinary drug residues in the Animal products recently.

A new CVL is under construction but will not be operational until at least 2009 (the building on the government local budget, while the furniture and equipment will be funded by the World Bank). Some improvement has been made to diagnosis of HPAI and other poultry diseases through the support of FAO (SFARA programme) during the year 2006/2007. However, the CVL despite the availability of basic equipment and to some extent trained staff is suffering all the time from the lack of reagents and consumables. Peripheral Veterinary Laboratory Services consist currently of two regional laboratories, one is in Hodaidah located in TDA (Tihama Development Authority) compound and the other one is located in Taiz within the Veterinary compound in Al-Hoban. Both of them are suffering from the scarcity of trained staff and operating cost to cover activities including reagents and laboratory consumables. Another laboratory was built in Marib Governorate to serve the Eastern region, and a new laboratory will be built in Abs – Governorate of Hajjah (building will be funded and constructed by the Public Workers Project and the furniture and equipment by the World Bank).

Animal Quarantine - Human health and veterinary legislation in Yemen stipulates that all imported livestock must be held for quarantine inspection on arrival. However, enforcing this regulation has some difficulties due to inadequate facilities at the entry point. Currently the Ministry of Agriculture & Irrigation identifies some quarantines and check points for export and import of live animals and animal products. Mocka Quarantine on the Red Sea is considered the main entry point for all livestock species; Mukalla quarantine on the Arabian Sea is considered the second largest quarantine for entry of livestock (small ruminants); two check points exist at the north-west border with Saudi Arabia (Hard check point) for animals, animal products and also for one day old chicks , and on the eastern border of Yemen with Oman, (Alshihin check point); Sana'a Airport for animal inputs (Vaccines , drugs .etc) and animal products and also for hatching eggs and one-day old chicks; Hodaidah and Aden Ports for animal inputs and animal products. All quarantines and checkpoints are not adequately facilitated including with qualified staff and other needed facilities. Therefore efforts are needed for improving quarantine facilities to assure good and smooth operation at all the five entries.

Because of Yemen having a particular geographical position; it is considered a crossing road for animal trading between Africa and the Arabic Peninsula. Traditionally, livestock traders prefer this route because of the proximity of exportation ports of the African continent (mainly in Djibouti and Somalia) with the Yemeni ports. Traditional nomadic routes cross international boundaries and smuggling livestock along the borders is common. It is very likely that disease is imported from countries such as Somalia and although stocks arrive with health certificates, the standards are questionable

With the support from the Agriculture Arab Development Organization, a study was done for developing the quarantine station for both Plant and Livestock. Designs were done for refurbishing Al-Mokha quarantine, but it needs some revision to fulfill the standard requirements for facilities like this. Therefore the Al-Mohka Quarantine

was include in the World Bank Project (Rain fed Agriculture and Livestock Project), which will be built and equipped.

Slaughterhouses management including **meat inspections** was in 1994 transferred from DGAR to the General Corporation of Slaughterhouses & Meat Markets, which belongs to the Ministry of Municipalities (which is currently called Ministry of Public Works and Roads). This makes the quality and hygiene control of the slaughtered meat for human consumption independent. This Corporation is also responsible at the moment to control in addition to slaughterhouses the live animal markets including poultry, butchers shops, poultry slaughtering shops and applying sanitary regulations and also controlling the implementations of those regulations. However, the Organization and Protection of Livestock Law No 17 from the Year 2004 gives the MAI the rights to control meat inspection and Animal Markets, but this is still not in force in this field.

Quality control of activities - In general the veterinary services within the DGAR have no functioning system for quality control over activities that are implemented by the DGAR and its related departments and also over those veterinary services and activities offered by the private sector. The DGAR, with the help of some donors such as World Bank being also part of on going project, is working out the Livestock Policies and strategies including those of veterinary services and animal husbandries.

Strengths and weakness of the veterinary services in the country

Strengths:

- Veterinary sector's, MAI and GoY attention- as shown by series of meetings held, plans prepared, decrees passed, and the recent holding of training workshops addressing the animal diseases in particular HPAI and other TADs diseases.
- There are interagency Operation Rooms defined (this kind of a committee responsible for the infectious diseases) and in place for highly infectious animal diseases including HPAI;
- Regulation on protection of livestock (Law No. 17, but need to enforcement)
- Experience in dealing with the RVF outbreak in 2000-2001;
- The pool of trained Animal Primary Health Care Workers in some remote areas;
- Health workers available to support at villages and Districts;
- Surveillance Centers in some governorates (although not enough);
- Diagnosis capability and equipment but need improvements;
- CVL linkage with reference labs in UK ;
- International organization support (FAO, USAID, World Bank).

Weaknesses

- Surveillance and diagnostic capacities (no clear HPAI and other important epidemics case definition, cooperation among governorates, complete data, virus isolation and antigen detection tests, communication, data management, risk analysis, regional labs);

- Line of commands from the top to down;
- Lack of funds/ delayed release of funds;
- Need for more trained staff in concerned sectors (vets in all districts);
- Need to enhance regulatory framework ;
- Practice of recycling untreated manure;
- More than 95 percent of poultry farms are Sector 2-3 with low biosecurity;
- Presence of ambulant live bird markets (mobile markets or car markets)
- HPAI Action Plan implementation details to be put in place;
- Lack of people and vet professionals motivation;
- Reports of suspected cases not coming from remote areas;
- Coordination between government related authorities;
- No compensation system although it is part of the Law No17 from the year 2004;
- Means of Transport ;
- Lack of reporting system between the private sector and the Government;
- Lack of central slaughterhouses (there are two in Dhamar and not working);
- Quarantine ports not fully functional and also not fully facilitated;
- Full authority over meat inspection and LBM not yet with MAI;

8. Description of local poultry genetic resources

There are two local breeds of indigenous chicken. One of them is called “*Albaladi Aljabali*” and is located in the high mountains and uplands. It is characterized by mostly red-golden as a dominant color and other different color on chest and tail. It has medium size weight of about 1Kg on average at maturity. This breed is used for meat and eggs, it can produce 33 eggs per year and its numbers are about 6 millions. The second breed is called “*Albaladi Alsahili*” which is located in the lowland coastal areas. It is characterized by a dominant white-brown color with other colors distributed in the different sites of the body. It is medium to big size; weight about 1.3 kg on average at maturity. This breed is also used for meat and eggs, it can produce 35 eggs per year and its numbers are estimated at 4 millions (Alma’amri, 1993, Reports on indigenous Poultry Breeds). For further description please see the photos in Annexes 6 and 7. Indigenous local chicken still need more research studies about classification, production, health, management and other aspects which requires technical and financial support.

9. Policy and regulatory framework

It is clear in the Law No 17 from the Year 2004 pertaining to the Organization and Protection of Livestock that the competent Authority is the Directorate General of Animal Resources. The Law and its bylaw document (Executive Regulation), which was issued under Cabinet’s resolution No. 1 for the year 2006 include all regulations and rules according to the OIE standards for epidemics containment, quarantine control, protection of wild animals and birds, licensing, organization of the veterinary profession, meat inspection and markets control. In the event of a spread of epidemics which require culling of infected animals or animals suspected of infection, the law gives the Government the right to compensate the animal owners through an

ad hoc committee, which should be established by a Cabinet decree according to a proposal submitted by the Minister of Agriculture. The law also obligates all institutions in the central and local authorities as well as other entities, organizations and individuals to cooperate and work with the competent authority in order to put to force the provisions of this Law and its executive regulation, particularly with regards to issues related to controlling the spread of declared animal epidemics and diseases. However, the ministerial resolutions for implementing the law mentioned above, which must give the practical details on the farm level, are not ready yet and are still under the preparation.

10. Donor funds

There are some rural development programmes funded by the international donors, most of which have livestock components in the field of local farmer training and animal production activities but little is allocated for veterinary services and the DGAR has no influence on using these funds and the programmes work independently from the DGAR financially and technically. Small technical cooperation programmes (TCP) are funded by the IAEA in the field of laboratory technology transfer.

The World Bank is funding a project named “Development of Rain Feed Areas and Livestock”, which became active late 2007. In this project the development elements include:

- Establishing, strengthening and refurbishing the livestock infrastructure at the HQ and local levels in the selected governorates including surveillance network, quarantines, CVL and some regional laboratories;
- Training programmes for HQ and field personals and;
- Creation of public-private partnership in the field of veterinary services.

Moreover, USAID implemented during the last 4 years in five governorates (Marib, Shabwa, Aljawf, Sa’dah and Amran) an Agriculture Development Programme.

The World Bank identified a one million USD project through a grant for supporting Yemen in enhancing it preparedness plan for HPAI according to the integrated HPAI Action Plan that was prepared with the help of the World Bank.

NGOs distributed poultry to the poor families in some poor areas in the country as follows:

Project	Agency	Duration	Geographical area	Direct benefiting	Status
International community services	Tell food + NGOs	2002-2006	Hajah province	120	closed
Care organization	SPFS + NGOs	2005 – 2007	Hajah province	700 women	Closed

Source :DGAR information for 2007

11. Contingency National Plan to address HPAI

The National Contingency Plan objectives are:

- Strengthening the Central, regional and communities capabilities to survey, investigate, diagnose and contain the HPAI outbreak, which required continues efforts.
- To assist in bridging implementation gaps on the national and village level.
- Facilitate the involvement of local farming communities to acquire core capabilities in implementing the national plan at the grassroots level in case of HPAI out break actually occurs in Yemen.

To achieve the above objectives, the National Plan considers the following:

- Strengthening of specific grassroots capacities for early detection, reporting and response to possible disease outbreak. (Rather than building another system for monitoring and detecting, local systems should instead feed into the existing national structure for disease surveillance and reporting).
- Strengthening of specific grassroots capacities for disease prevention and control in support of the implementation of the national programme.
- Public information management and awareness campaign including support to the production and dissemination of technical documents and farmer teaching materials.
- Programme for coping mechanisms for farmers in the event of outbreaks

Moreover the National Plan identified the gaps and the weaknesses in the Surveillance and diagnostic system in the country and identified the needs to strengthening the peripheral and central surveillance and diagnostic network.

12. The proposed integrated National Action Plan for HPAI

The proposed Integrated National Action Plan recently finalized with assistance from the World Bank presents an integrated approach between the animal health aspects of avian influenza prevention and pre-pandemic and pandemic aspects of human avian influenza. Only the part related to prevention and control of avian influenza in poultry is summarized below.

This Component outlines, by budgeted subcomponent and activity, the interventions to be carried out by the first responder Ministry of Agriculture and Irrigation and its agencies.

- Develop and enforce preventive measures to keep the HPAI virus from entering the country;
- Attack the HPAI virus at source should it enter the country, and
- Employ all necessary resources along the market chain of the poultry sector to stamp out and eliminate the virus

These measures will be supported by optional tools related to mass and/or ring vaccination, compensation and the development of disease-free zonal areas.

This component comprises of 7 sub-components:

Avian Influenza Control Policy - Developing a Control Strategy requires addressing the need to develop a focused control strategy, to strengthen inter-agency cooperation and collaboration, and to define the disease control policies of stamping out, compensation and vaccination.

A targeted approach in high-risk areas needs to be focused on the areas from which the most likely infection threats will come. These are in Yemen the 9 governorates of Ibb, Taiz, Sana'a, Sa'adah, Amran, Dhamar, Al Baydah, Al Hudaydah and Al Dali which must be considered at high risk because of their poultry and human population densities and number of poultry farms that would be conducive to HPAI virus circulation in case of emergence of the disease in the country. The development of a focused avian influenza strategy activity is defined as a planning activity by the High and Technical Committees, led by the veterinary and medical services of MoAI and MoPHP. As an internal cost, it is therefore not budgeted.

Inter-agency cooperation and collaboration is indeed essential. Private sector representatives of the veterinary and medical associations, and those representing poultry trade and production need to be considered as members of the High and Technical Committees as the private sector will play a major role in preventing or controlling highly pathogenic avian influenza. This activity is the responsibility of the operational representatives on the Technical Committee, their deputy ministers on the High Committee, and MoF. It represents an internal cost and is therefore not budgeted.

Implementation of Disease Control Policies requires setting up conditions for stamping out, outbreak containment, vaccination and compensation which are three important tools in the fight against avian influenza, provided they are used in a rational and timely manner. Implementation of these measures in case of the disease appearing in the country is costly. In order to face a possible outbreak of highly pathogenic avian influenza, it is necessary that the Government be prepared to take charge of all costs related to stamping out, compensation and part of vaccination costs through constituting an emergency contingency fund.

- Conditions for stamping out and containment, associated to ring vaccinations, are well described in the integrated action plan. The cost of these activities, based on an estimate of outbreak events would be about US \$ 6 million over 3 years and should be paid from emergency contingency funds. For initial emergency ring vaccination, Government could call on the OIE to provide at very short term a limited stock of vaccines from its emergency vaccine bank constituted in 2006 to assist its member countries in such events.
- Depending on whether the first outbreak appears on commercial or backyard poultry, the vaccination strategy may be implemented differently. However, vaccination of backyard poultry is to be borne entirely by the Government

while commercial poultry vaccination would be borne by the private sector. Assuming that, in the worst possible case, all backyard poultry would have to be vaccinated, the cost for the Government could reach as much as US \$ 10 million over three years. Indeed, assistance from donors would most certainly be activated in such a case, but it is Government responsibility to make sure that enough funds are available in due time to at least cover the costs of vaccination during one year, in case such an event was to occur.

- Compensation is essential for any planned efficient response to the occurrence of a highly pathogenic avian influenza outbreak. It should be seen as an investment rather than a cost, as the cost-benefit ratio of paying compensation is quite positive. Furthermore, the cost of compensation represents only a relatively small proportion of the overall direct costs of the damage wrought by avian influenza in terms of market collapse, containment costs, poultry worker unemployment, loss of tourism and social costs. Deciding on a compensation policy as part of a highly pathogenic avian influenza preparedness plan must therefore be seen as a major and integral tool, contributing to the effective control of avian influenza in poultry. According to the integrated action plan for HPAI, A contingency fund of \$ 6 million should be earmarked by MoF to cover the cost of compensation anticipated by a medium-level avian influenza infection rate.

Strengthened Laboratory Diagnostic Services- The Integrated action plan for HPAI preparedness rightly considers laboratory diagnostic services as essential to early detection of the disease allowing for an emergency response. Early disease detection and rapid response to prevent or reduce poultry losses is the single most important remedial intervention that will prevent the expenditure of large sums by both Government and the private sector, not counting import substitution of frozen poultry, trade embargoes, and human loss of life and illness. The Plan includes three main actions.

- **Upgrading the Central Veterinary Laboratory** is estimated to cost US \$ 3.12 million and includes renovation of existing facilities, additional staff, training, equipment, consumables etc.
- **Strengthening Regional Veterinary Laboratories** has been estimated to cost US \$ 2.27 million but detailed lists of needs do not take into account already available financial supports.
- **Upgrading District Veterinary Centers in High-Risk Governorates.** Fund to be allocated for training, PPE gear and field travel allowances are estimated to be in the order of US \$ 0.5 million.

Expanded Disease Surveillance and Epidemiology - This Subcomponent aims to expand surveillance from the central to district levels and convert surveillance from a passive to an active mode. It requires the introduction of early warning (EWARS) at all levels, including at the village level. It is composed of:

- **Strengthening the MoAI Operations Room and Central Strategic Epidemiology Unit** is to be done through the allocation of funds for computerized mapping hardware and software; study tours and support for local and regional meetings and an international consultant in epidemiology. Total cost is estimated to be US \$ 0.67 million.

- **Standardized Regional and District surveillance and reporting** will upgrade the Regional surveillance centers in 9 high-risk governorates to undertake effective disease outbreak response. The total cost is estimated to be US \$ 1.31 million.
- **Community-based Village Early Warning and reporting** aims at mobilizing participating communities to undertake simple disease recognition of high pathogens avian influenza and reporting these to the authorities. The cost is estimated to be US \$ 2 million.

Enhanced Poultry Farm and Marketing Biosecurity - This Subcomponent is designed to instill behavior change in three groups of poultry operators: poultry farm owners, live bird market operators and poultry shop owners. The objective is to make stakeholders aware of the importance of farm, market and shop biosecurity and safe poultry handling by applying acceptable techniques, disinfection and poultry handling hygiene to break virus contamination along the poultry marketing chain. The budget for this component is estimated at US \$ 583,900.

Comprehensive Public awareness and Information- The subcomponent has three activities, targeting awareness messaging to consumers, TV and radio messages to stakeholders, and printed information materials. Its cost is estimated at US \$ 358,760.

Enhanced Quarantine and Border Security- The two activities under this Subcomponent aim to strengthen overland and airborne entry points with the objective to reduce the legal and illegal entry of infectious HPAI virus, carried in poultry.

- **Strengthening high-risk overland entry points:** The two activities under this Subcomponent aim to strengthen overland and airborne entry points with the objective to reduce the legal and illegal entry of infectious HPAI virus, carried in poultry for a cost estimated at US \$ 98,000.
- **Strengthening airport biosecurity:** For the purpose of securing borders against the entry of passengers arriving at Sana'a International Airport from avian influenza-infected countries at a cost of US \$ 17,000.

Regulatory Framework and Enforcement - National and international veterinary regulatory consultants should be contracted for 4 person-months each to review the legal framework pertaining to emergency disease control intervention and regulations. The cost of this action is estimated to US \$ 146,000.

References

1. Ministry of Planning & International Cooperation, Central Statistical Organization: Statistical year book 2003 – 2006.
2. Ministry of Agriculture & Irrigation, General Department of Agricultural Statistics & Documentation and DGAR information for 2007: Agricultural statistics year book 2003 – 2006.
3. MOAI, General Marketing Department: Agricultural Marketing Yearbook 2006.
4. MAI General Directorate of Animal Resources: Commercial poultry survey 2006.
5. F. M. Qassim, 2003 – 2006, Facts & figures about agricultural sector. (In Arabic).
6. J. A. S. Al-Mamari, 2006: Investment value at commercial poultry sector. (In Arabic).
7. J .A.S. Al-Mamari, 2006: Situation status for commercial poultry sector & its participation in national food security (in Arabic).
8. J.A.S. Al-Mamari, 1993: Report on indigenous poultry breeds in Yemen (in Arabic).
9. NATIONAL AVIAN INFLUENZA ACTION PLAN (OUTBREAK RESPONSE PREPAREDNESS), REPUBLIC OF YEMEN AVIAN INFLUENZA PROTECTION PROGRAM, May 2006.
10. Dr. Mansoor M. Alqadasi, Dr. Khalid M. A. Saeed. April 2006 : Rapid Assessment “On Yemen Preparedness and Capabilities to Respond and Contain The Avian Influenza

Big and middle size private poultry companies and farms in Yemen					
No	Name	Address	Phone	Fax	Mail
Big size private companies and farms					
1	Al-salahy Poultry co	Dhamar –Radaa main st	06 – 373867	06 – 373870	alsalahipoultry@y.net.ye
2	Tarem Poultry co.	Sana'a – (R.O.Y)	01 – 401616	01 – 401571	tareemgroup@y.net.ye
3	Al-sanabani Poultry co.	Sana'a – (R.O.Y)	01 – 235933	01 – 251512	sapco@y.net.ye
4	Nakhlan Poultry co.	Sana'a – Al-zubairy st	01 – 209419	01 – 209418	nokhlan@yahoo.com
5	Azal Poultry co	Sana'a – (R.O.Y)	01 – 401616	01 – 401569	tareemgroup@y.net.ye
6	Noman Al-qohiza farms	Ibb – Uarim	04 – 503800	04 – 501378	SGUHIZH@YEMEN.NET.YE
7	Al-Aqeel Poultry co	Sana'a – Noqum (R.O.Y)	01 – 543378	01 – 543978	
8	Abdullah Al-qohiza co	Ibb - (R.O.Y)	04 – 403744	04 – 406420	
9	Al-Haijah Poultry farms	Sana'a – Noqum market (R.O.Y)	01 – 544672	01 – 544600	
Middle size private companies and farms					
10	Al-gharasi Poultry farms	Sana'a –Al-zuberi st. (R.O.Y)	01 – 240212	01- 263020	algharasi@y.net.ye
11	Al-zahiri Poultry farms	Sana'a – (R.O.Y)	01 – 350575	01 – 350019/ 350578	Al-zahri@y.net.ye
12	Al-falah Poultry farms	Dhamar – Rada st. (R.O.Y)	06 – 501400	06 – 502429	FALAH400@yahoo.com
13	Al-bahri Poultry farms	Ibb – Uarim ,Al-radhmah st. (R.O.Y)	04 – 501654	04 – 501955	

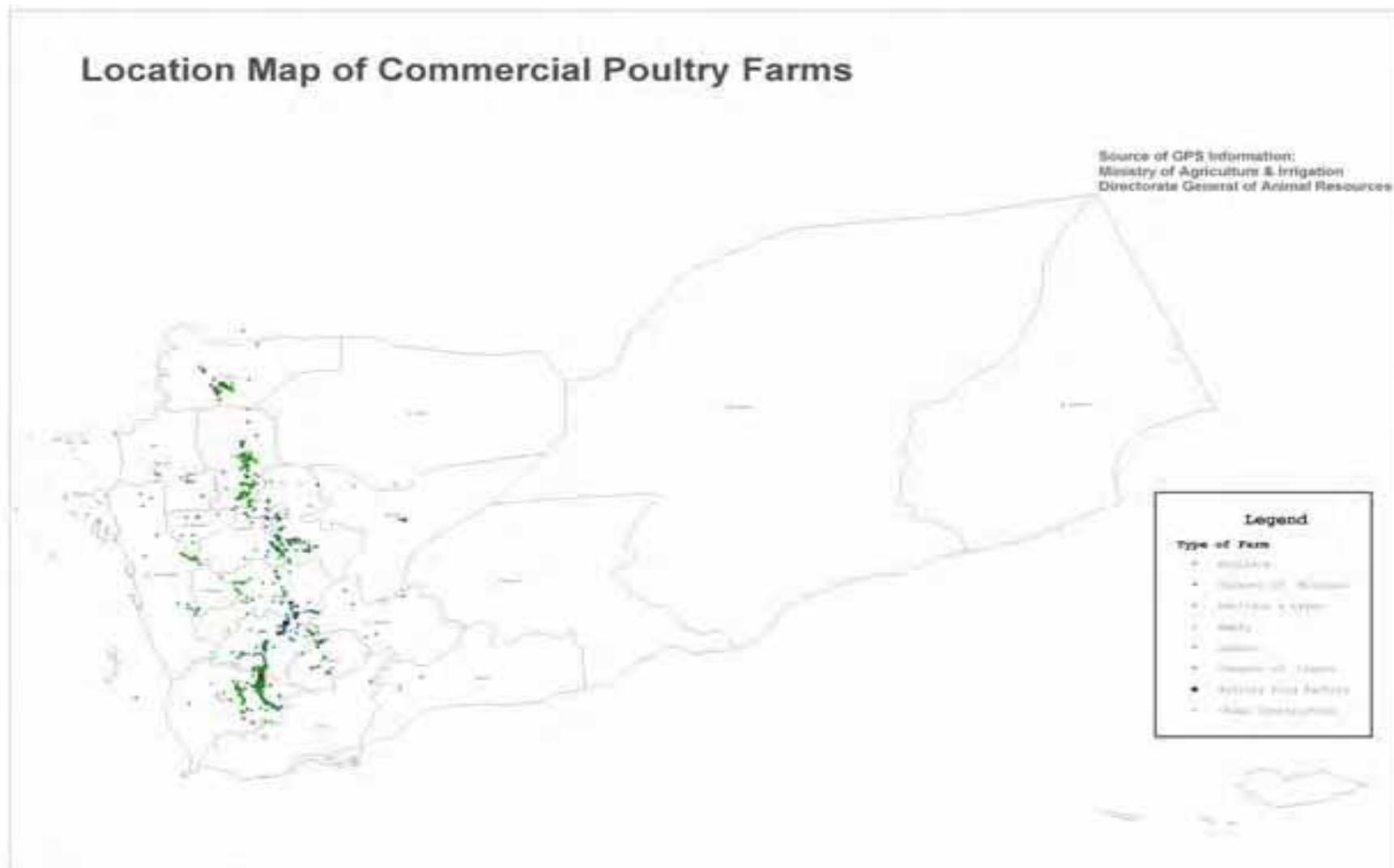
The Structure and Importance of the Commercial and Village based Poultry Systems in Yemen

Big and middle size private poultry companies and farms in Yemen					
No	Name	Address	Phone	Fax	Mail
14	Al-habal Poultry farms	Sana'a (R.O.Y)	01 – 336622	—	—
Mixed farm					
15	Marib Poultry co.	Sana'a – Magadisho st, (R.O.Y)	01 – 203178	01 – 209535	marpouye@y.net.ye
Middle Private companies and farms					
16	Al-nour Poultry co.				
17	Awda Poultry corporation	Sana'a – (R.O.Y)	01 - 674774	01 – 674775	—
18	Al –zilaie corporation				
19	Abdo Hamid Al-Sharabi	Sana'a – Al-rebat st. (R.O.Y)	01 – 406391	01 – 406109	alsharbyby@yemen.net.ye
20	Al-Monjedi for Poultry corporation	Amran main st. (R.O.Y)	07 – 612841	07 – 604133	ALMENGEDI@y.net.ye
21	Ibn Al-haj farms	Ibb ,Uarim main st (R.O.Y)	04 – 501724	04 – 502743	—
22	Saad Bajash farms				
23	Ahmed Abdullah Al-omiry farms	Sana'a – Taiz Road (R.O.Y)	—	—	—
24	Al-taheri Poultry farrms				
25	Ali Quid Jaodum farms	Sana'a – Khawlan st (R.O.Y)	01 – 661170	—	—
26	Khao Poultry farms	Ibb – uarim, khao area. (R.O.Y)	04 – 503616	04 – 503092	—
27	Al-morisy Poultry farms	Al-Dalea –Demta main street (R.O.Y)	71119022 (mobile)	—	—
28	Al-salam farms				
29	Al-arasi Poultry farms	Ibb - Urime –main street (R.O.Y)	04 – 501339	04 – 504481	—
30	Yamania feed co	Taize-main st. (R.O.Y)	04 – 250313		—
Middle Farmers					
31	Mohammed Abdulrab Al-Abduli farms				

The Structure and Importance of the Commercial and Village based Poultry Systems in Yemen

Big and middle size private poultry companies and farms in Yemen					
No	Name	Address	Phone	Fax	Mail
32	Qaa shraa farms				
33	Al- qodari farms	Dhamar – Qaa sharoa (R.O.Y)	06 – 501105	—	—
34	Yahia Abdo Ali Saleh farms	Taiz . Gamal st (R.O.Y)			
35	Al-Barari farms				
36	Ahmed Hezam Al-Yafai				
37	Al-shamhani farms	Sanaa – (R.O.Y)	01 – 246757	01 – 246757	
38	Al-jalal farms	Ibb -Uarim – (R.O.Y)	04 – 503616	01 – 503092	
39	Al-khair farms	Al-Baida – Radea (R.O.Y)	06 – 552534	06 – 552534	
40	Al-thakalen farms				
41	Al-bosaly farms				
42	Seham Poultry farms				
43	Al-Atas farms				
44	Ba botain farms				
45	Razih Poultry farms	Radea – main st. (R.O.Y)	06 – 554532	06 – 554535	
46	Abdullah Al-Faqih farms				
47	Abduljalil Al-Shamiri farms	Sanaa – (R.O.Y)	01 – 246757	01 – 246757	
48	Al-omairy Poultry farm	Sanaa – Taiz Road (R.O.Y)	—	—	
	Poultry Farm Association				
49	General Association for Poultry Producer and Markets	Sanaa - (R.O.Y)	01 – 240442	01 – 505477	

Source : DGAR information





Broiler poultry farms in Qaa Sharaa, Yarim district, Ibb governorate, Yemen.



Broiler poultry farms in Yarim district, Ibb governorate, Yemen



Battery production system



Layer poultry farm (Deep litter system)



Poultry slaughtering at the traditional market in at the rural area



Shop poultry house at the towns including the Sana'a City



Modern slaughter poultry house in Dhamar Governorate (not working at the moment)



Commercial poultry markets in Sana'a City (the Capital)



Some pigeons in the market



Local chickens at the market



AL-Baladi AL-Jabali breed (male)



AL-Baladi AL-Jabali breed (female)



AL-Baladi AL-Sahili breed (male)



AL-Baladi AL-Sahili breed (female)

The Structure and Importance of the Commercial and Village based Poultry Systems in Yemen

Annex 6
DGAR Organizational Chart

