

中国高致病性禽流感防控工作策略

HPAI Prevention and Control Strategy for China

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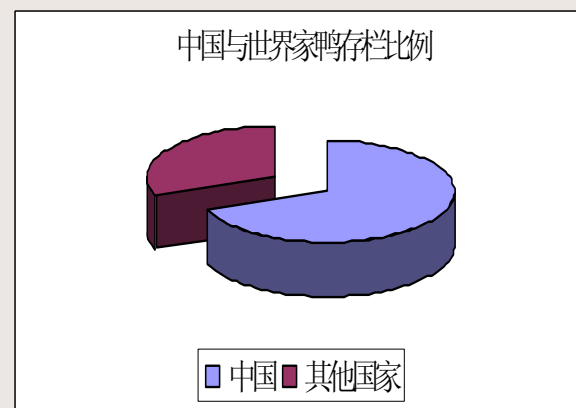
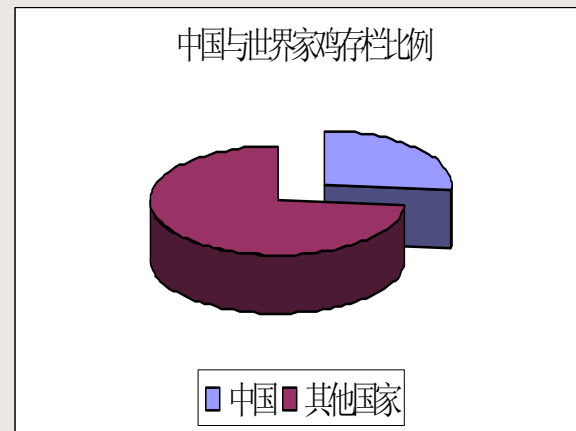
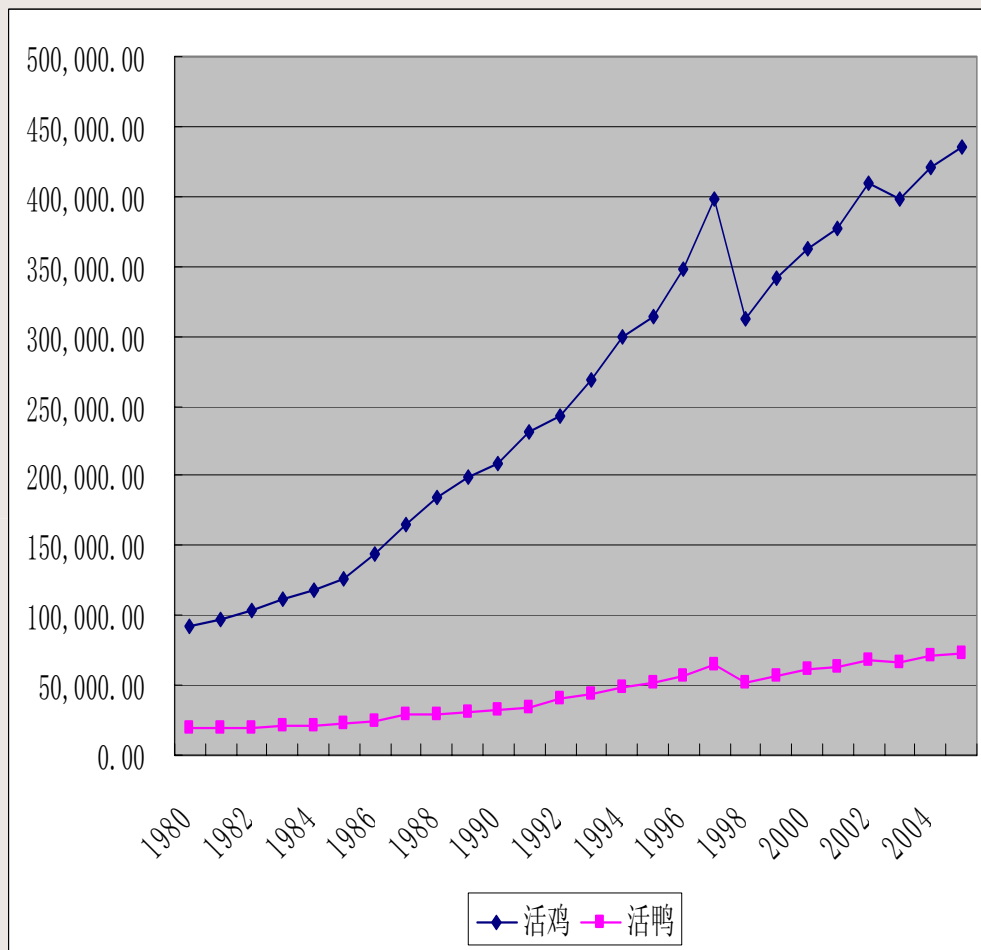
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一、家禽业生产情况

1. Production of China's Poultry Industry

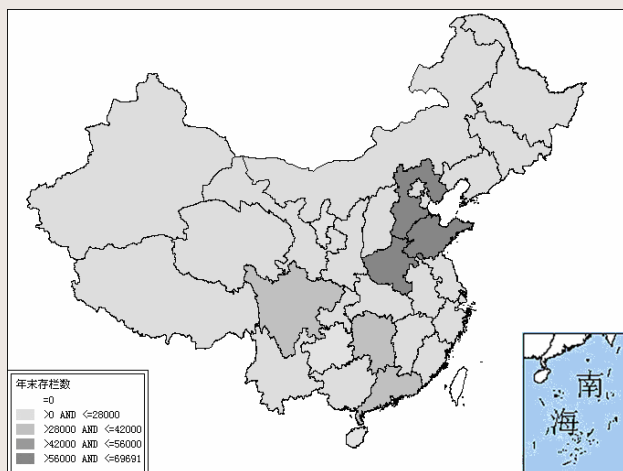
(一) 家禽业发展现状

1.1 Current Situation of China's Poultry Industry



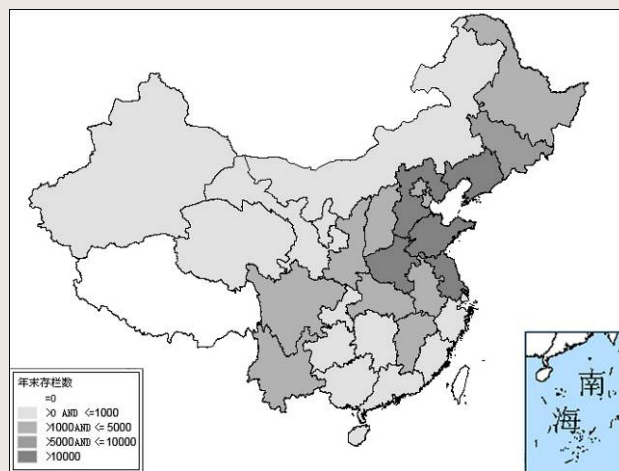
(二) 家禽业区域分布特征

1.2 Regional Distribution Features of Domestic Poultry Industry



家禽分布

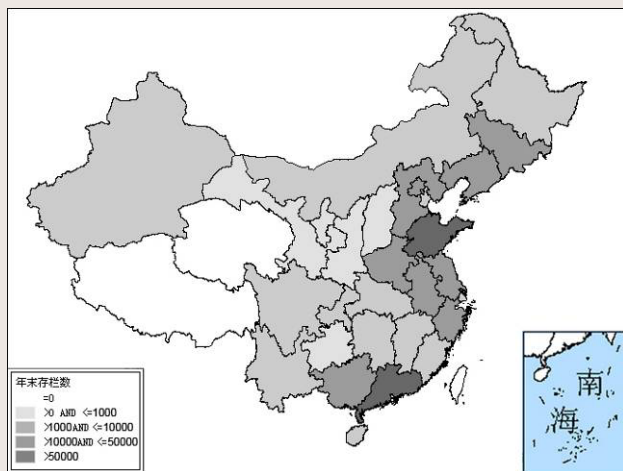
Poultry



蛋鸡分布

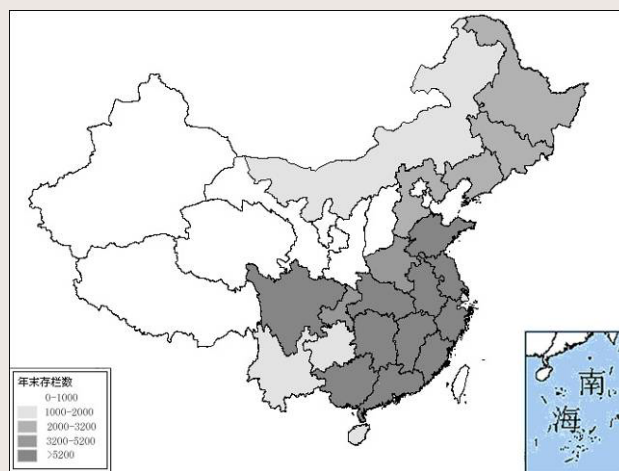
Egg

Layer



肉鸡分布

Broiler

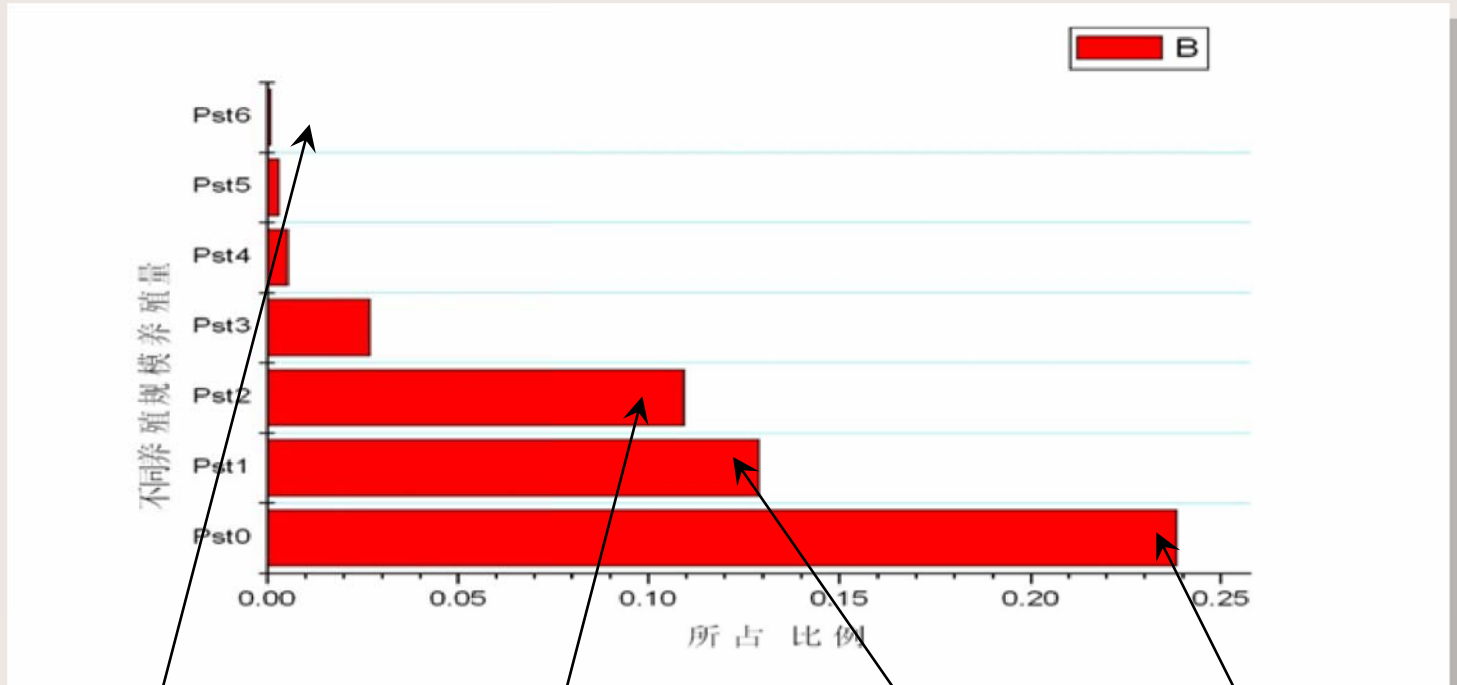


水禽分布

Water-fowl

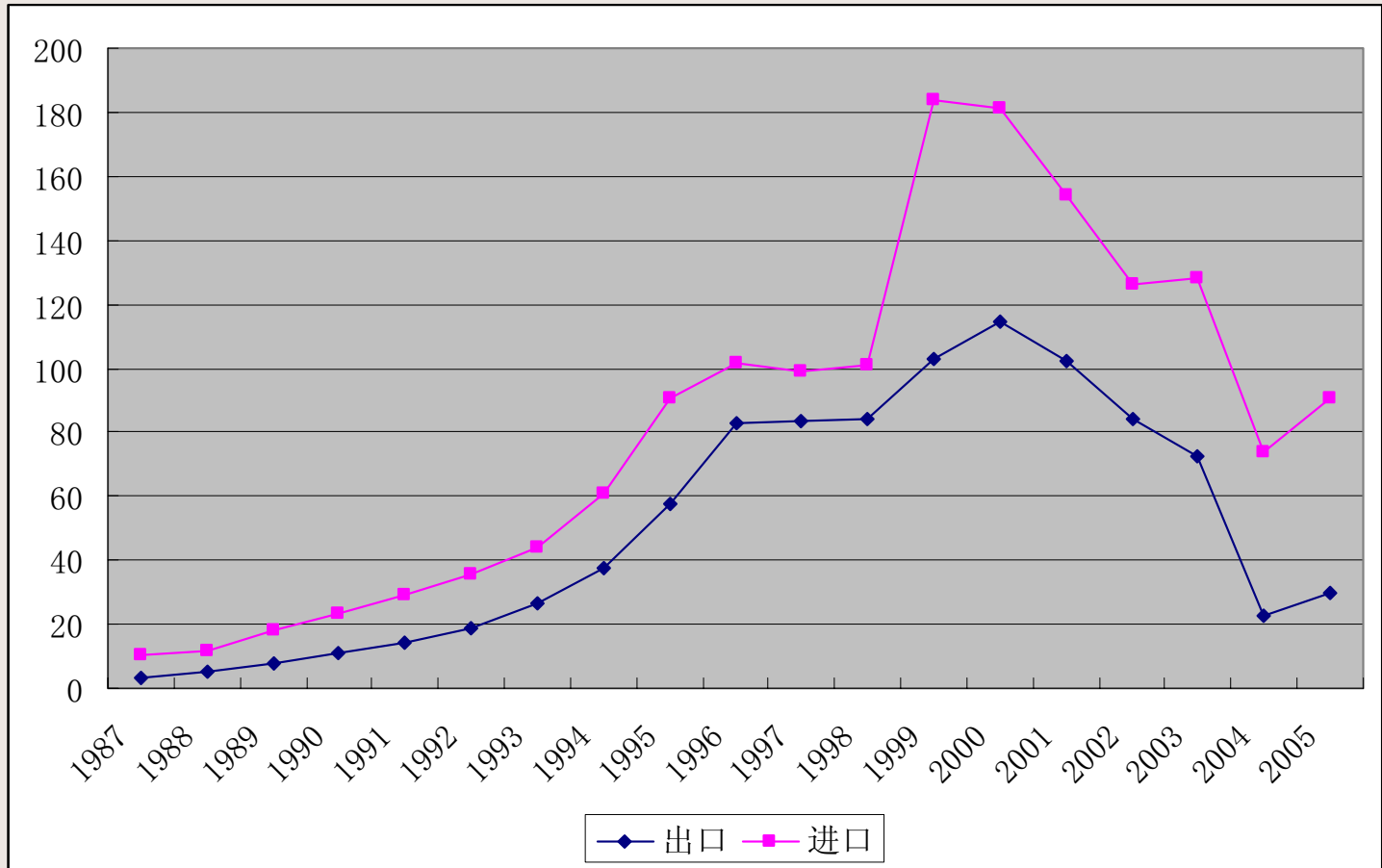
(三) 家禽饲养模式

1.3 Poultry Rearing Patterns in China



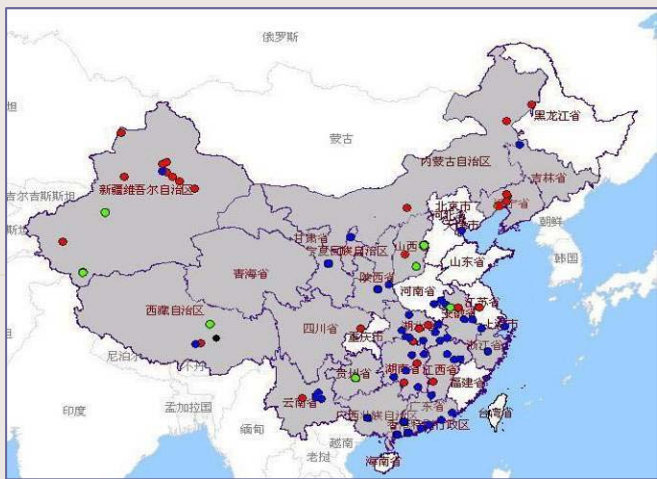
(四) 禽肉进出口贸易

1.4 Poultry Meat Import & Export in China

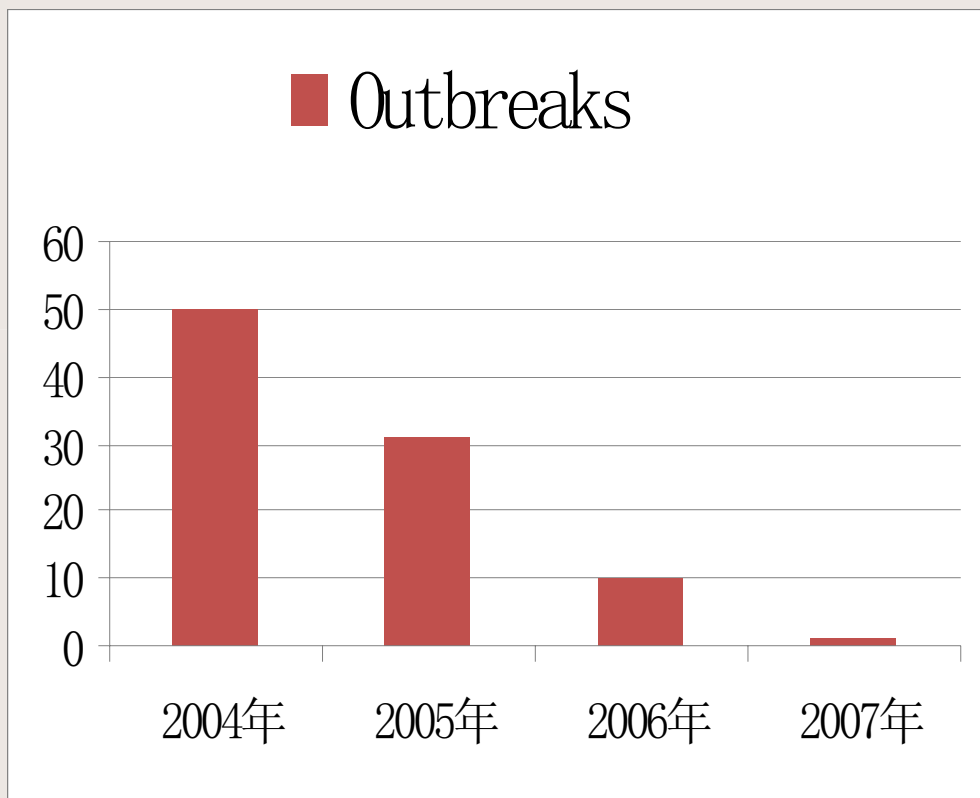


二、高致病性禽流感发生情况

2.Situation on HPAI Outbreaks in China



时间 Year	疫情省数 Number of Provinces with HPAI Outbreak	疫点数 Number of Infected Area	禽鸟数量 Poultry		
			发病数 Cases (Ten Thousand)	死亡数 Death Number (Ten Thousand)	扑杀数 Number for Culled Poultry (Ten Thousand)
2004	16	50	14.49万	12.91万	904.5万
2005	12	31	15.82万	15.46万	2257.12万
2006	7	10	9.1万	4.7万	298.52万
2007	2	2	--	1.12	6.13万
合计 Total	22	93	41万	31万	3465万

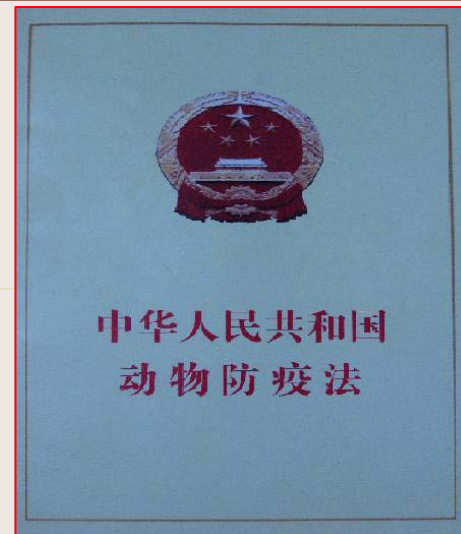


三、防控工作策略

3. HPAI Prevention and Control Strategy

(一) 坚持预防为主， 增强风险防范能力

3.1 Putting Prevention First, Improving Risk Prevention Capacity.



- 《中华人民共和国动物防疫法》规定，国家对动物疫病实行预防为主的方针。

The Law of the People's Republic of China on Animal Epidemic Prevention clearly specified that the state practices the principle of putting the prevention first with regard to the animal diseases.

- 中国把高致病性禽流感列为一类动物疫病。按照预防为主的方针，中国政府确立了免疫与扑杀相结合的综合防控政策。

HPAI is classified as one of the Category I Animal Disease in China. In accordance with the above principle, Chinese government implements a comprehensive control policy combining vaccination and stamping-out strategies to tackle HPAI.

- 2004年发生高致病性禽流感疫情后，各地依法对重点地区家禽实施强制免疫。
After HPAI outbreaks occurred in 2004, compulsory vaccinations were imposed on poultry flocks in priority areas according to relative laws.
- 为构筑坚实的免疫屏障，提高禽群保护水平，降低禽流感发生风险，中国政府于2005年10月决定对所有家禽实施强制免疫政策。

For the purpose of establishing solid vaccination barrier, improving poultry's antibody protective level, reducing HPAI outbreak risk in China, the government decided to implement compulsory vaccination policy towards all poultry flocks.

1. 加大禽流感疫苗研发力度，提高禽流感防控科技水平

3.1.1 Attaching more strength on HPAI vaccine development, and improving the science and technology levels for AI prevention and control.

Name	Usage	Features
Inactivated AI vaccine H5N2	Prevent chicken develop AI caused by AI H5 subtype virus.	The first vaccine being successfully applied to prevent and control HPAI in China.
Inactivated Recombinant AI vaccine (H5N1 , Re-1 strain)	Prevent chicken, duck and goose develop AI caused by H5 subtype virus	This vaccine can be applied to waterfowl.
Recombinant fowl pox vector live vaccine (subtype H5)	Prevent AI caused by H5 subtype.	This vaccine can identify vaccination and wild virus.
Recombinant live vaccine against AI and Newcastle Disease (rL H5 strain)	Prevent AI caused by H5 subtype and Newcastle Disease.	It is the first safe and effective live vector vaccine using negative RNA strand virus.
Inactivated Bivalent AI vaccine (H5N1 , Re-1 strain and H9N2 Re-2 strain)	Prevent AI caused by H5 and H9 subtype.	This vaccine can prevent AI infection caused by H5 and H9 at the same time.
Inactivated Recombinant bivalent AI vaccine (H5N1, Re-1 strain and Re-4 strain)	Prevent AI infection caused by H5 subtype.	This vaccine can be used to prevent AI caused by the current circulating H5 virus strain.

2. 保证禽流感疫苗质量，提高生产供应能力

3.1.2 Safeguarding AI vaccines quality and improving production and supply capacity.

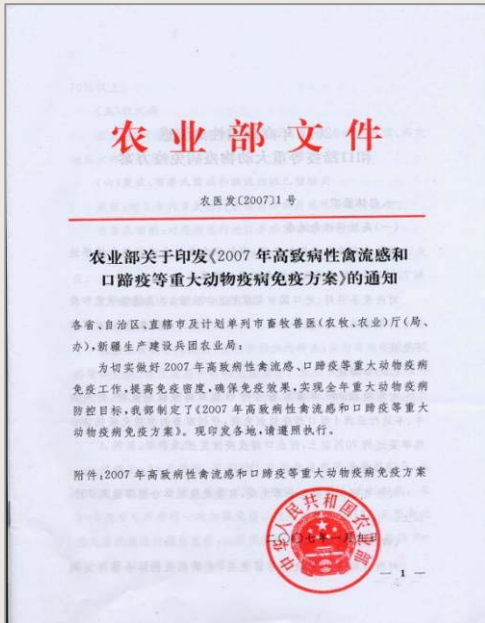
- 8家定点疫苗生产企业，灭活疫苗年生产能力161.8亿羽份，活疫苗年生产能力250亿羽份，完全可以满足中国家禽免疫需要。

At present, the Ministry of Agriculture has totally appointed 8 factories to produce AI vaccines, with production capacity of 16.18 billion doses of inactivated vaccines and 25 billion doses for live vaccines. The total output of AI vaccines in China can fully satisfy the demand of the domestic market.



3. 规范禽流感免疫程序，切实提高家禽免疫保护水平

3.1.3 Standardizing AI vaccination procedures to improve the immune protection level of the poultry population.



- 所有家禽进行强制免疫，疫苗免费，确保免疫密度；

All poultry are subject to compulsory vaccination and the vaccine is free of charge. The vaccination coverage should be guaranteed.

- 规范免疫程序，规模养殖场按程序进行免疫，散养家禽实施春、秋两季集中免疫，新补栏家禽及时补免，提高免疫质量；

The vaccination procedures are standardized. All scale poultry farms should carry out vaccination according to relative scientific vaccination standards, while backyard poultry flocks are subject to the spring-autumn vaccination campaign. Restocked poultry should be vaccinated in time and the quality of vaccination should be further improved.

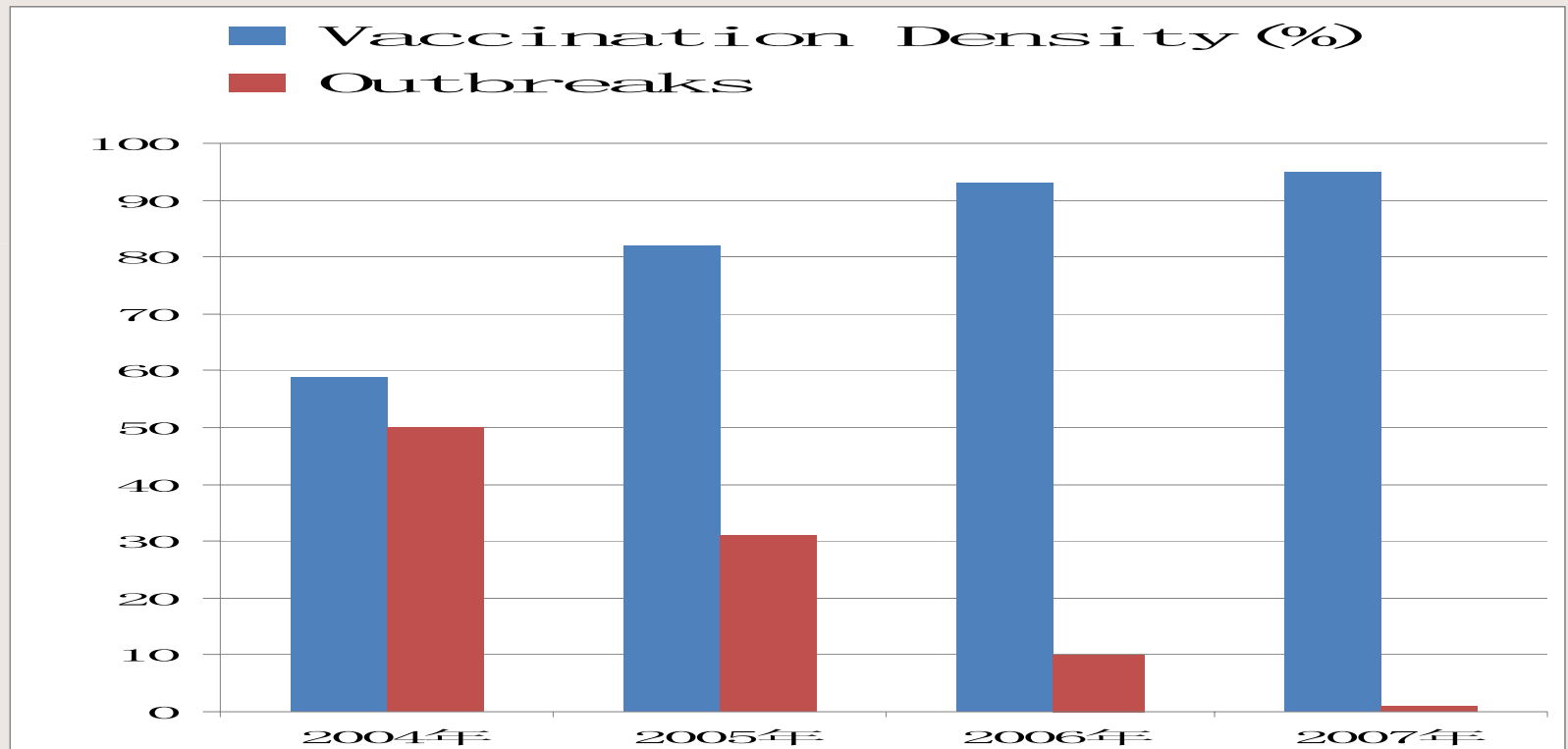
- 强化免疫效果监测，有效抗体合格率低于70%的禽群要加强免疫；
- 防疫条件好、进口国有要求的出口企业，经省级兽医行政管理部门批准，可以对家禽不免疫；

In case that the importing country has relevant requirements and the exporting enterprise has good animal health conditions, poultry of the enterprise are allowed not to practice vaccination with the approval of veterinary administration departments at provincial level.

- 建立防疫工作责任制，实行免疫密度目标管理。
- 据统计，2006年全国免疫家禽106亿羽，应免家禽免疫密度超过95%。

According to the statistics, the vaccinated poultry in 2006 reached to 10.6 billion, and more than 95% of the poultry which were subjected to vaccination had been vaccinated.

Vaccination situation	Outbreaks	Percents	
unvaccinated	66	72.5%	85.7%
Un-proper vaccination	12	13.2%	
vaccinated but had a low titer of antibody	22	14.3%	



(二) 加强疫情监测，提高风险预警能力

3.2 Strengthen epidemic surveillance and improve early-warning capacity.

1. 健全禽流感监测体系

3.2.1 Strengthen AI surveillance system.

- 农业部在中国农业科学院哈尔滨兽医研究所设立了国家禽流感参考实验室，在中国动物疫病预防控制中心和中国动物卫生与流行病学中心建立了流行病学监测实验室，三个实验室具备病原学检测能力。

The MOA has set up the National AI Reference Laboratory in the Harbin Veterinary Research Institute, Chinese Academy of Agricultural Science, a national key veterinary diagnostic laboratory in China Animal Disease Control Center and the national epidemiological surveillance laboratory in the China Animal Health and Epidemiology Center. The above three laboratories all have the capacity for pathogen detection tests.

- 31个省级动物疫病检测实验室，生物安全水平可达到2级或3级，具备熟练的禽流感PCR检测技术。

31 animal disease testing laboratories at provincial level have been constructed with investments from the MOA and relative local governments. The bio-safety levels for these labs all meet BSL-2 or BSL-3 standard and their PCR testing techniques are all quite mature.

- 所有市、县均设有疫病检测实验室，可从事禽流感血清学检测工作。

Animal diseases surveillance labs have been set up at all county and municipal levels in China. AI serological tests can be practiced in these labs.

- 在动物饲养密集区设立了304个疫情测报站，在边境地区设立了146个边境动物疫情测报站。

Moreover, the MOA has set up 300 animal disease surveillance stations at the areas with high animal density and 146 border animal disease surveillance stations at the border areas of the country.

China has established the animal diseases surveillance system at Central, provincial, municipal and county levels.

全国边境动物疫病监测站、疫情测报站分布图



2. 规范禽流感监测程序

3.2.2 Standardizing the surveillance procedures

- 根据联合国粮农组织（FAO）、世界动物卫生组织（OIE）的防控禽流感指导原则，农业部每年都制定全国高致病性禽流感监测计划：

In accordance with guidelines of FAO and OIE, the National Surveillance Program for HPAI has been revised and issued by the MOA each year.

- 加大活禽交易市场禽群的检测数量；

Enlarge the samples quantity from live-bird-markets.

- 定期定点对种禽场和商品场进行抗体水平监测；

Conduct periodical surveillance on antibody level towards breeding poultry farms and commercial poultry farms.

- 加大猪和野鸟的监测数量，发现的死鸟需全部进行监测；

Enlarge samples quantity of swine and wild birds and all found-dead birds should be tested.

- 组织实验室检测技术培训，开展国家和省级实验室检测能力比对；

Launch validation experiments on test assays for provincial and national labs and conduct training courses on testing techniques nation-wide.

- 强化流行病学调查，进行风险分析，建立分级预警机制。

Strengthen epidemiological investigation, carry on risk analysis and establish a classified early-warning mechanism.

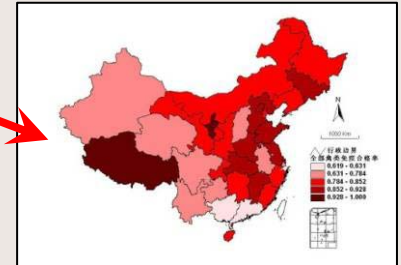
农业部文件

农医发〔2004〕14号

关于印发《全国高致病性禽流感监测计划(试行)》的通知

各省、自治区、直辖市及计划单列市畜牧兽医(农牧、农业、动物卫生监督)厅(局、办)、新疆生产建设兵团农业局：

为加强秋冬季高致病性禽流感防治工作，切实做好高致病性禽流感监测工作，及时掌握高致病性禽流感疫情动态，落实各项防控措施，确保禽流感免疫效果，我部组织制定了《全国高致病性禽流感监测计划(试行)》，现印发给你们，请遵照执行。



动物种类 Animal Species	监测类别 Types of Surveillance	样品数 NO. of Samples	阳性数/合格数 No. of Positive	阳性率/合格率 Positive Rate
家禽 Poultry		5751017(免疫vaccinated)	5009347	87.10
	血清学 Serology	528825 (非免疫 unvaccinated)	0	0
	病原学 Etiology	410794	30	0.007
野生禽鸟 Wild Birds	血清学 Serology	754	2	0.27
	病原学 Etiology	22039	16	0.07
猪 Pig	血清学 Serology	44465	10	0.02
	病原学 Etiology	22835	0	0
其他鸟类 Other Birds	血清学 Etiology	14313 (免疫 vaccinated)	9339	65.25
		221 (非免疫 unvaccinated)	0	0
	病原学 Etiology	15606	1	0.006
环境样本 Environmental Samples	病原学 Etiology		3	

3. 动态监视病毒变异情况

3.2.3 Monitoring the variation of HPAI virus in a dynamic manner

- 国家禽流感参考实验室发现，2006年2月从山西省阳泉市种鸡场发生疫情的H5N1亚型高致病力禽流感病毒（CK/SX/06）出现新的变异：

The National Avian Influenza Reference Laboratory detected that new mutation took place on the gene sequences of HPAI virus CK/SX/06 strain isolated from Yangquan City, Shanxi province in Feb., 2006.

- 该病毒与中国96年广东鹅分离株的HA基因同源性只有90%左右，并且在抗原性上有较大差异（64倍以上）；

The virus HA gene only shares 90% homogeneity with that of isolates from Guangdong duck in China in 1996, and their differences on antigenicity is also very significant (about more than 64 times).

- 原有疫苗免疫对该病毒的攻击只提供83.3%的免疫保护率（H5N2:5/6; H5N1:10/12）；

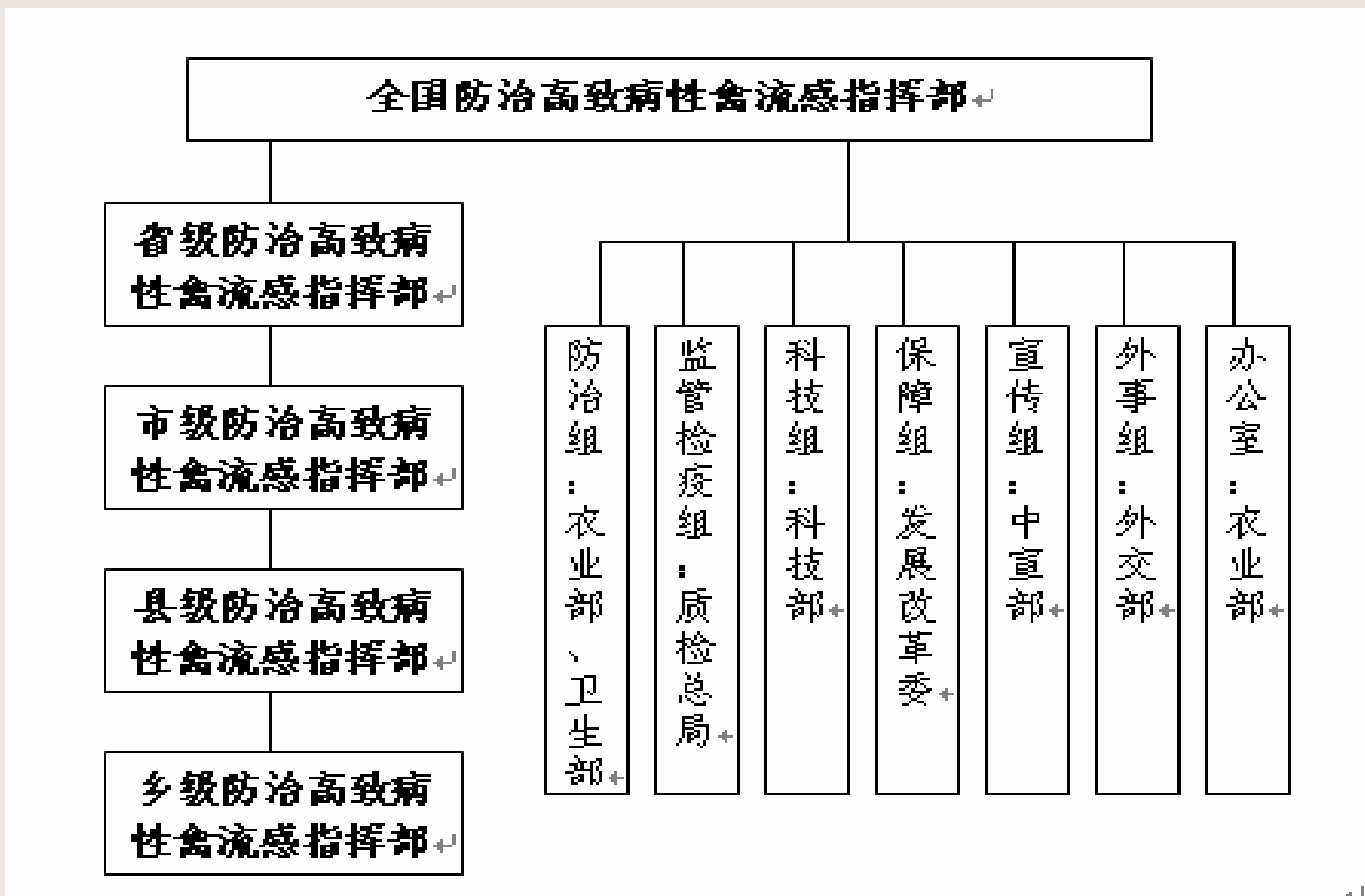
The existing vaccines only provide 83.3% protective rate against the virus challenge (H5N2: 5/6; H5N1: 10/12).

- 研发出新型疫苗并大面积使用，有效保障了免疫效果。

New vaccine has been developed and used in a large scale. Thus, the vaccination efficacy has been maintained.

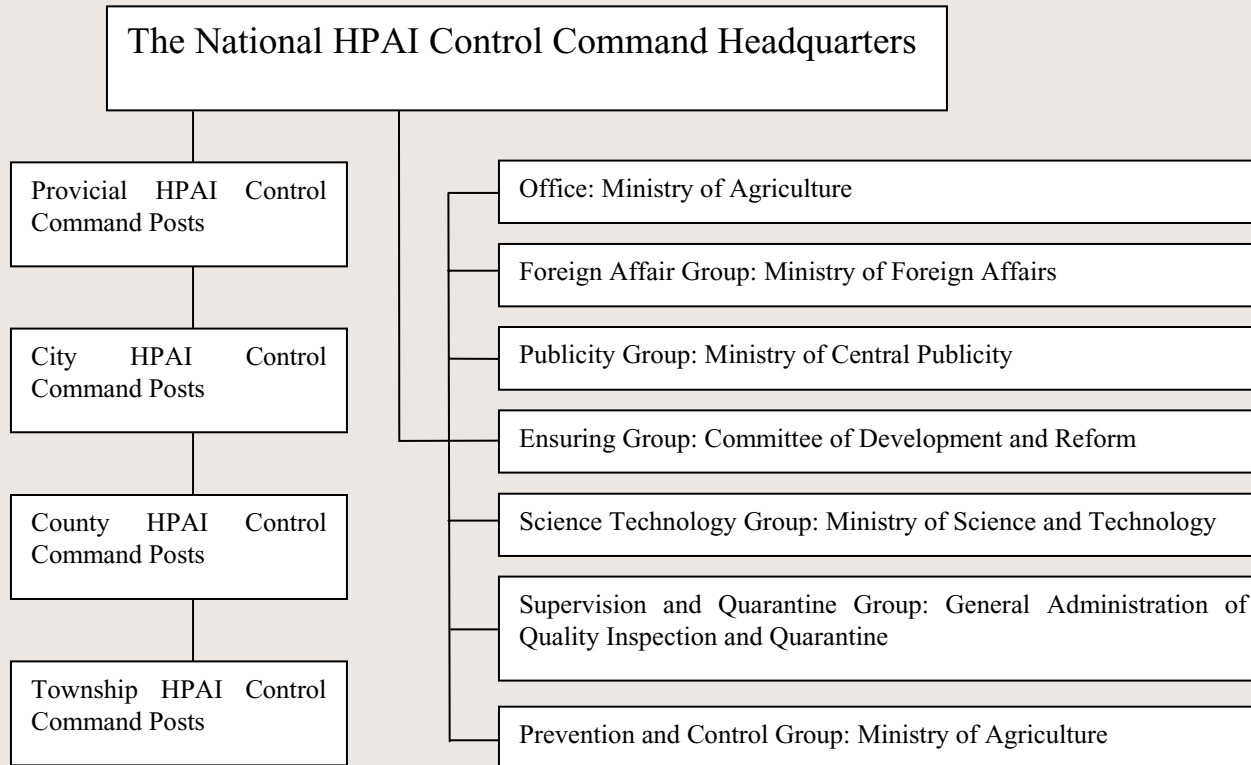
(三) 完善应急反应机制，提高疫情处置能力

1. 完善应急处置指挥体系



3.3 Improve quick-response mechanism, enhance the capacity for dealing with epidemic.

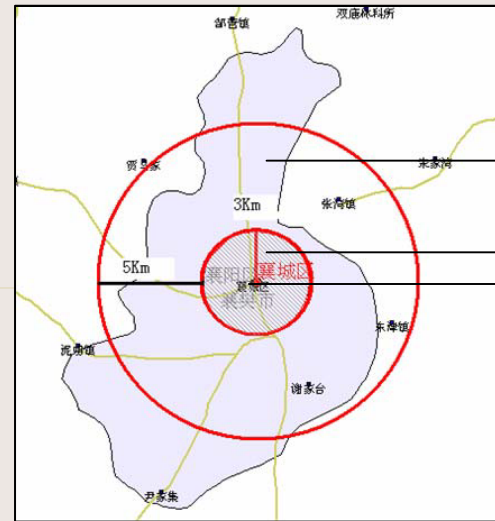
3.3.1 . Improve the emergence commanding system



2. 健全应急处置机制

3. 3. 2 Improve the emergency response mechanism

- 追踪疫源 Tracing
- 划定疫点、疫区、受威胁区。
- **Demarcation of infected spots, infected areas and threatened areas**
- 扑杀和无害化处理。扑杀疫点疫区内所有的禽只。
Stamping-out and Biosafety disposal. All poultry within infected areas should be culled.
- 流通控制。县级以上人民政府决定对疫区实行封锁。
Movement Control. The local people's governments at or above county levels are responsible for issuing quarantine on infected areas.
- 紧急免疫。对受威胁区内所有易感染禽类进行紧急强制免疫接种，并建立完整的免疫档案。
Emergency vaccination. All susceptible birds within threatened areas are subject to emergency compulsory vaccination and complete vaccination records should be kept.
- 关闭交易市场。关闭13公里范围内的活禽和禽类产品交易市场。
Closing the market. All live birds and poultry products markets within 10-kilometer radius around the infected spots must be closed.
- 解除封锁。21天以上的监测，未出现新的传染源。
Quarantine lift. The quarantine will be lift if more than 21 consecutive days without detecting any new cases.



3. 恢复生产能力

3.3.3 Recover poultry production capacity

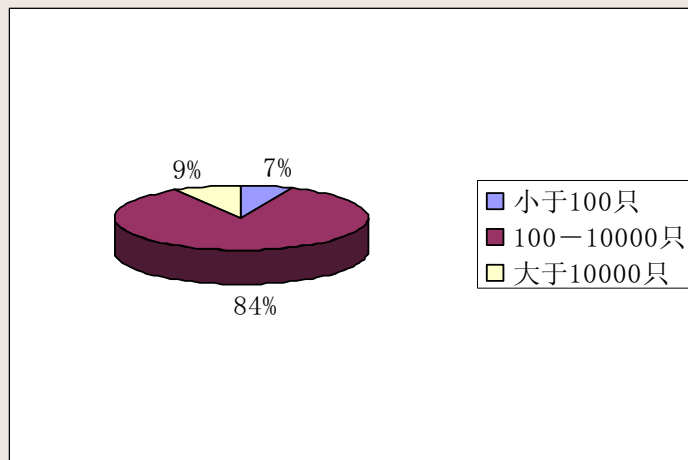
- 《国务院办公厅关于扶持家禽业发展的若干意见》。
“The State Council Office’s Opinions on Supporting the Poultry Industry Development”
- 对家禽免疫和疫区家禽扑杀给予财政补贴，每只人民币10元；
Offering financial allowances for poultry vaccination and poultry culling in infected areas.
10 Yuan RMB per head.
- 对有关企业免征所得税，增值税即征即退；
Exempting the concerned enterprises from income taxation, returning the VAT as soon as collected.
- 兑现出口退税，适当减免部分地方税；
Fulfilling the export tax drawback, and reducing or remitting partial local taxation.
- 2005年11月，国务院决定中央财政从预算总预备费中安排20亿元，设立高致病性禽流感防控基金。
In November 2005, the State Council decided to allocate 2 billion RMB to set up HPAI Prevention and Control Fund from the total budget reserve of the central finance.



（四）提高养殖户防控意识，转变家禽饲养方式

3.4 Improve farmer's awareness for prevention and control of the disease, change poultry rearing patterns of the industry.

Farming Scale	Outbreaks	Percents
Less than 100 (Backyard)	6	6.6%
100-10,000	80	87.9%
10,000-50,000	5	5.5%
More than 50,000	0	0%



- 2007年，国务院发布《关于促进畜牧业持续健康发展的意见》，要求各地转变养殖观念、调整养殖模式，创新生产、经营制度，发展规模养殖和畜禽养殖小区，改变人畜混居、畜禽混养的落后状况，改善农村居民的生产生活环境；

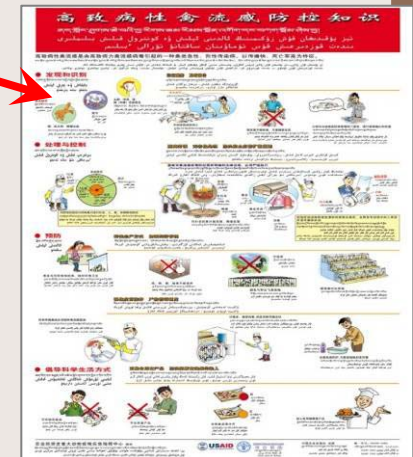
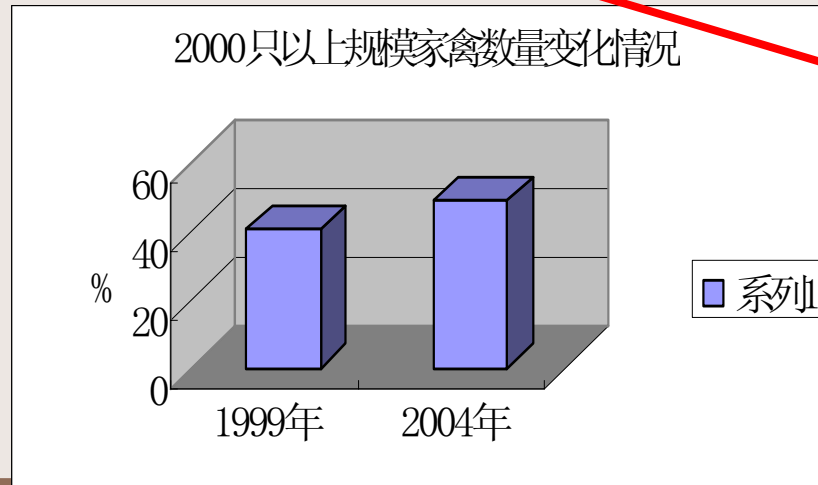
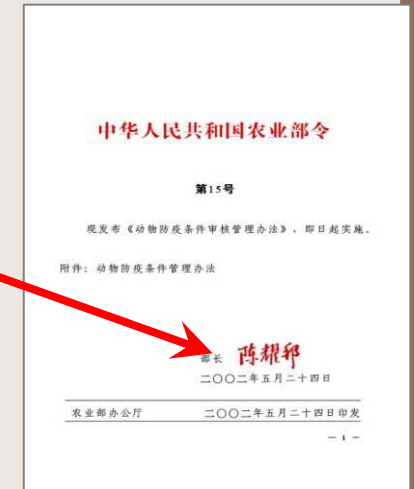
In 2007, the State Council issued “Opinion in Promotion of Sustainable and Healthy Development of Animal Husbandry”, demanding people in various places to change husbandry ideas, adjust husbandry patterns, create new production and management systems to develop scale husbandry, establish livestock and poultry raising compartments, change the backward conditions of mixture of human and livestock, and mixture of different animal and poultry species, and to improve the production and living environment of rural residents.

- 农业部发布《动物防疫条件审核管理办法》，要求动物饲养场、孵化场及交易场所等必须符合规定的动物防疫条件，促进家禽业向标准化、规范化、清洁化饲养方式转变。

The MOA issued “Animal Epidemic Prevention Conditions Check and Management Method” demanding all the holdings, hatcheries and markets to be in compliance with specified animal health conditions, and to promote the transformation of poultry industry into practices of standardization, formalization and cleanness.

- 农业部和地方政府有计划地实施了禽流感等重大动物疫病科普知识宣传行动，增强公众防范意识，转变农户饲养观念。

The MOA and local government initiated in a planned way the popular science publicity on major animal diseases including HPAI, so as to improve public awareness and change farmer's idea on raising livestock.



（五）建设无疫区，提高区域禽流感防控水平

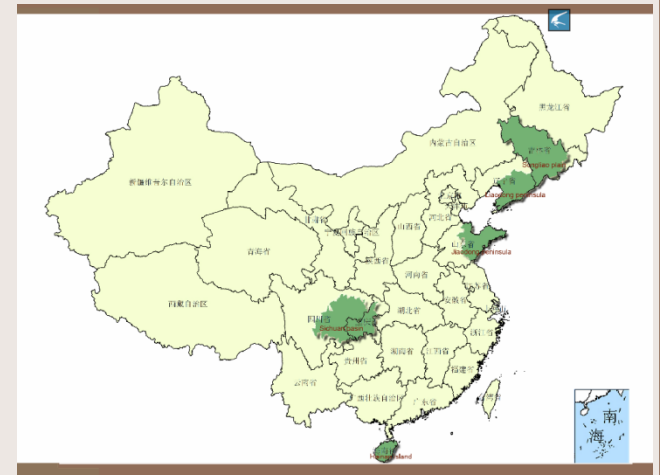
3.5 Establish specific disease free zone, improve regional capacity on prevention and control of HPAI.

- 中国政府已投资19亿元，参照WTO/SPS协定及有关国际组织标准，在四川盆地、辽东半岛、松辽平原、胶东半岛和海南岛建立了高致病性禽流感、新城疫、猪瘟、口蹄疫无疫区。

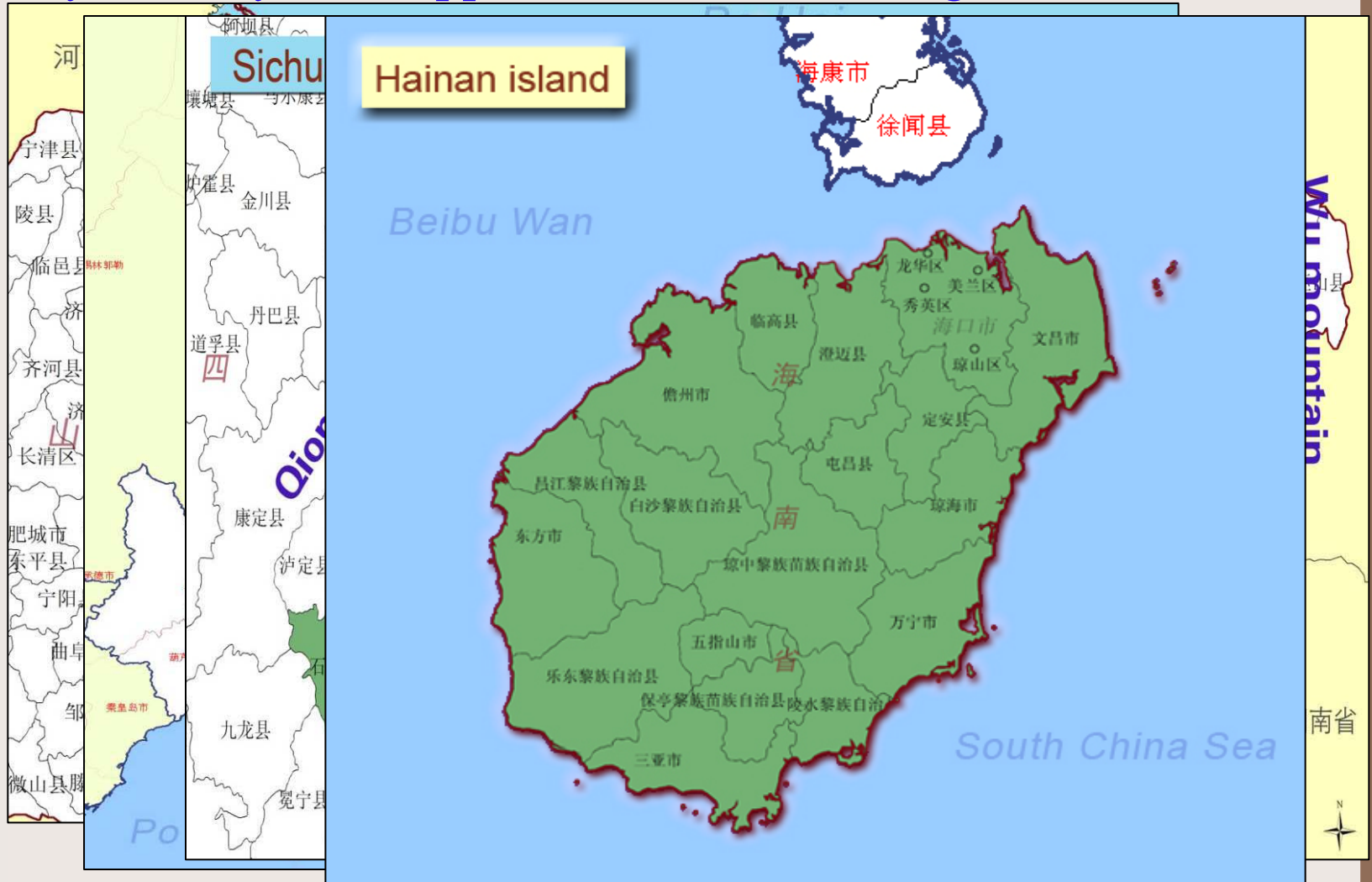
The Chinese Government has invested 1.9 billion Yuan to establish HPAI-, ND-, CSF- and FMD- free zones in the Sichuan Basin, the Liaolng Peninsula, the Songliao Plain, the Shandong Peninsula and the Hainan Island , in reference to WTO/SPS Agreement and concerned standards of international organizations.

- 下一步，中国农业部将组织全国动物卫生风险评估专家委员会，对上述区域进行评估，申请国际无疫认证。将进一步总结经验，鼓励和指导其他地区建立无疫区，不断提高全国动物卫生保护水平。

Next, the Ministry of Agriculture will organize the national animal health risk assessment expert committee to evaluate the mentioned zones, and apply international disease-free recognition, and MOA will further summarize the experiences, encourage and instruct other regions to establish free zones, in order to improve national animal health protection level constantly.



These areas are all surrounded by natural barriers such as sea, rivers and mountains or by necessary artificial barriers, thus they are easy to be applicable in close management



(六) 推进兽医管理体制改革，完善动物防疫体系

3.6 Push forward the reform on the veterinary administration system, improve the animal epidemic prevention system.

- 根据国务院《关于推进兽医管理体制改革的若干意见》，中国省、市、县兽医行政管理、兽医行政执法和兽医技术支持体系已经基本建成。

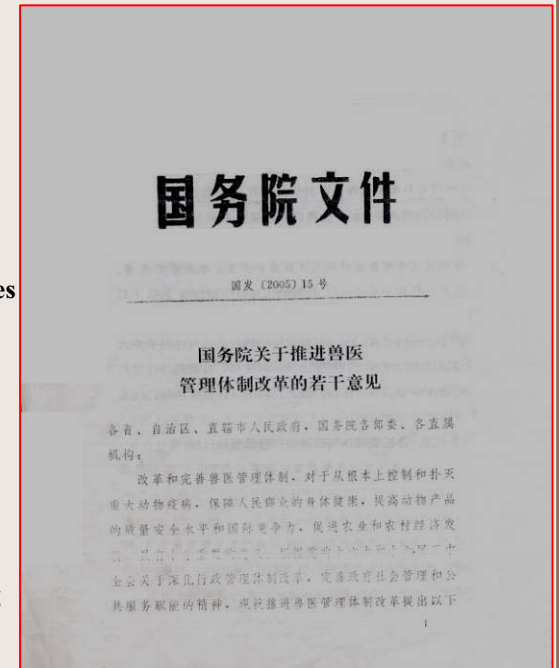
Accelerating the reform of veterinary administration system at grass-roots level. The State Council issued *the Several Opinions on Accelerating the Reform of Veterinary Administration System* in 2005. The veterinary administrative departments, law enforcement departments and technical support departments at county, municipal and provincial levels have almost been completed their construction.

- 今后一段时期，将着力抓好乡、村基层兽医队伍建设，完善禽流感等重大动物疫病防控体系。

In the following certain period, priority will be given to the construction of veterinary systems at sub-country and village level for the improvement of the major animal diseases prevention and control system.

- 同时，农业部将根据《动物防疫法》、《兽药管理条例》和《病原微生物实验室生物安全管理条例》规定，进一步加强检疫监管、疫苗质量监管和实验室生物安全监管工作，提高全国动物卫生安全水平。

According to the requirements laid down in “The Law on Animal Epidemic Prevention,” “Veterinary Drug GMP” and “The Regulations on Biosafety Management of Pathogen Microorganisms and Laboratories”, the Ministry of Agriculture is further strengthening quarantine supervision, vaccine quality control and laboratory biosafety control, in an attempt to increase national animal health safety level.



(七) 加强禽流感防控科研工作，提高防控科技水平

3.8 Strengthen and facilitate HPAI prevention, control as well as scientific researches, improve science and technology levels for prevention and control of HPAI.

- 研制新型疫苗；
Develop new vaccines;
- 动态监视病毒变异情况；
Monitor the mutation and variation of AI virus in a dynamic manner;
- 家禽、水禽、留禽、候鸟带毒情况及病毒传播规律研究；
Conduct regular researches on the virus carrying situations among poultry, waterfowls, resident birds and migratory birds, understand the transmission regulation of the virus among these birds;
- 动物疫情预警机制研究；
Carry out researches on the early-warning mechanism of animal epidemic ;
- 高致病性禽流感防控经济学研究；
Economics study on HPAI prevention and control
- 国际交流与合作。
International exchanges and cooperation.

中国禽流感病毒国际交流统计表

年份	提供国	接受国	数量	病毒亚型
1994	英国	中国		H1-H15,N1-N9全部HA-NA禽流感病毒分型系统
2004	中国	WHO	6	H9亚型
	英国、美国、日本	中国	20	H9亚型
	中国	WHO	5	H5N1亚型
2005	蒙古	中国	6	H5N1亚型（迁徙鸟）
2006	中国	WHO（美国CDC流感中心）	18	H5N1亚型
2007	越南	中国	6	H5N1亚型

Table 5-1 International AI Virus Exchange with China

Year	Providing Country	Accepting Country	No. (strain)	Virus subtype
1994	England	China		H1-H15 N1-N9
2004	China	WHO	6	H9 subtype
	England ,US Japan	China	20	H9 subtype
	China	WHO	5	H5N1 subtype
2005	Mongolia	China	6	H5N1 subtype (migratory birds)
2006	China	WHO(US CDCAI Center)	18	H5N1 subtype
2007	Vietnam	China	6	H5N1 subtype

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四、结论

Conclusion

- 中国家禽饲养量大、饲养方式相对落后，发生高致病性禽流感疫情的风险依然存在。

Given the large poultry population in China and its relatively backward rearing patterns, the risk for HPAI outbreaks still exist in China.

- 通过实施免疫和扑杀相结合的综合防控政策，中国高致病性禽流感疫情得到有效控制。实践证明，防控措施是符合国情、有效的。

The HPAI outbreaks have been put under control effectively through comprehensive measures combining vaccination and stamping out strategies. Practices have proved that Prevention and control strategies are effective and fit to the nation's conditions.

- 中国启动了高致病性禽流感防控行动，禽流感风险防范能力、早期预警能力、风险人群认知能力、生物安全控制能力、基层动物防疫队伍工作能力以及区域疫病控制能力将不断加强。

China has initiated the HPAI control campaigns: AI risk preparedness capacity, early warning capacity, risk population recognition capacity, biosafety control capacity, work capacity of the grass-roots animal epidemic prevention staff and the zonal disease control capacity are being constantly increased.

- 中国禽流感防控工作已由疫情发生后的被动应急处置向事前主动防控转变，由临时性布置向制度性安排、规范化运行转变，由一般性号召和业务指导向政策支持、科技支撑转变，禽流感防控长效机制逐步形成。

The AI control activities have been changed from passive emergent treatment after disease outbreak to pre-active control, from temporary arrangement to systematic arrangement and standardized operation, from general calls and professional instructions to policy support and science and technology backup. A long standing mechanism for AI control has been gradually shaped.

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Thank you for your attention!