

**FEED SAFETY IN CHINA:  
CURRENT SITUATION & PROSPECTS**

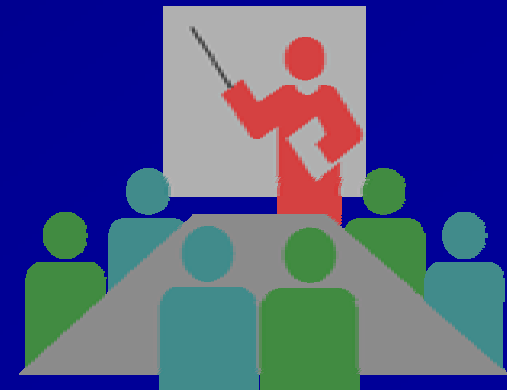
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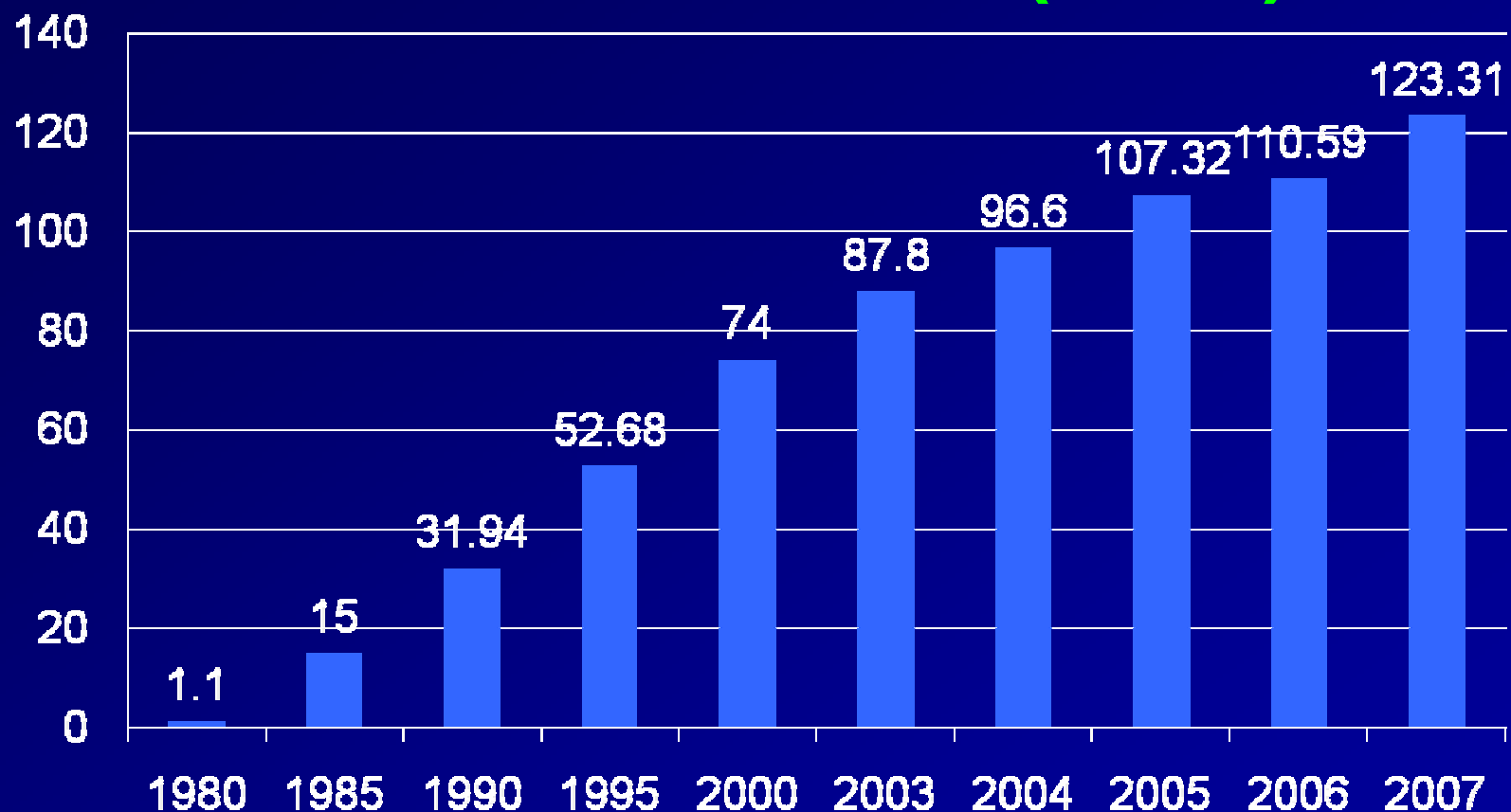
# Achievements & current situation



## Importance of China animal production in the world

- **Pork production accounts for 44% of world production**
- **Egg production accounts for more than 30% of world production**
- **Milk production has a great potential to be developed**

# Feed production (MT) in China from 1980 to 2007 (MOA)



From 1980 to 2007, feed production in China increased by 112 times and 19.1% yearly.

## Profile (%) of animal feeds in China from 1990 to 2007

	Pig	Meat poultry	Layer poultry	Fish & shrimp	Others
1990	56	22	18	4	
1995	42	24	26	3	5
2000	36	27	24	9	4
2007	26	34	20	14	6

# Advances in feed Industry & animal husbandry over the last 30 years

		1978	2007
FCR	Broiler	2.5:1	1.8:1
	Pig	4.1:1	3:1
	Laying hen	3:1	2.4:1
Efficiency	Pig to reach market wt (d)	300	180
	Broiler to reach market wt (d)	65	42
	Eggs / laying hen	100	260
	Milk yield/cow (kg)	3000	4500

Source: Ministry of Agriculture, PRC

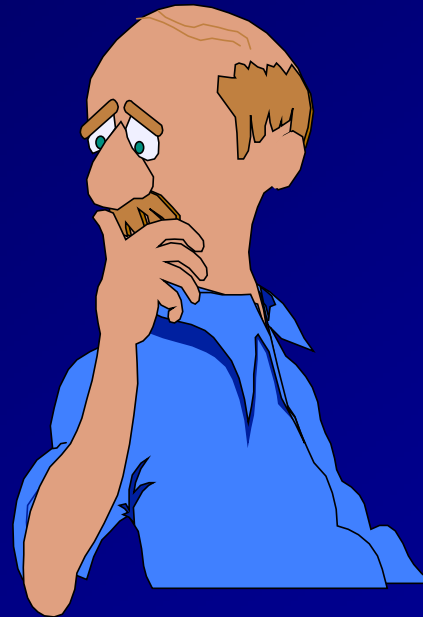
## Stead improvement in feed quality

	1987	1990	1995	1998	1999
Pass rate, %	20	59.7	62	89.7	95.7

**This figure has been maintained over 95% since 2001.  
Source : MOA, PRC**



# Major challenges



# 1. Heavy shortage of feed ingredients

- In China, around one third of domestic grains are used as feed ingredients , 40% of arable land are used to produce feed grain. China imports about 30MT soybean and 1 MT fish meal annually.
- Most of non-traditional potential feed resources are not utilized properly.



## Estimated supply of energy ingredients in China from 2000-2020

	2000(MT)	2010(MT)	2020(MT)
<b>Requirement</b>	<b>255</b>	<b>340</b>	<b>408</b>
<b>Supply</b>	<b>189</b>	<b>257-297</b>	<b>366-416</b>
<b>Shortage</b>	<b>66</b>	<b>38</b>	<b>48</b>

Source: National Office of China Feed Industry, Developmental Strategy of China Feed Industry: 1996-2020

## Estimated supply of protein ingredients in China from 2000-2020

	2000(MT)	2010(MT)	2020(MT)
<b>Requirement</b>	<b>45</b>	<b>60</b>	<b>72</b>
<b>Supply</b>	<b>21</b>	<b>22</b>	<b>24</b>
<b>Shortage</b>	<b>24</b>	<b>38</b>	<b>48</b>

Source: National Office of China Feed Industry, Developmental Strategy of China Feed Industry: 1996-2020

## **2. Feed safety problems still existed**

- It still existed some food safety issues related to animal production. Some of them are feed-oriented, which have produced adverse effects on sustainable development of animal husbandry as well as social stability.**

### **3. Livestock pollution problems**

- **Intensive animal husbandry has increased risk of feed additives, nitrogen, phosphorus, heavy metals etc pollution to water and soil.**
  - **For instance, waste water from animal husbandry has become the third largest pollutant next to that from industry and urban inhabitants.**

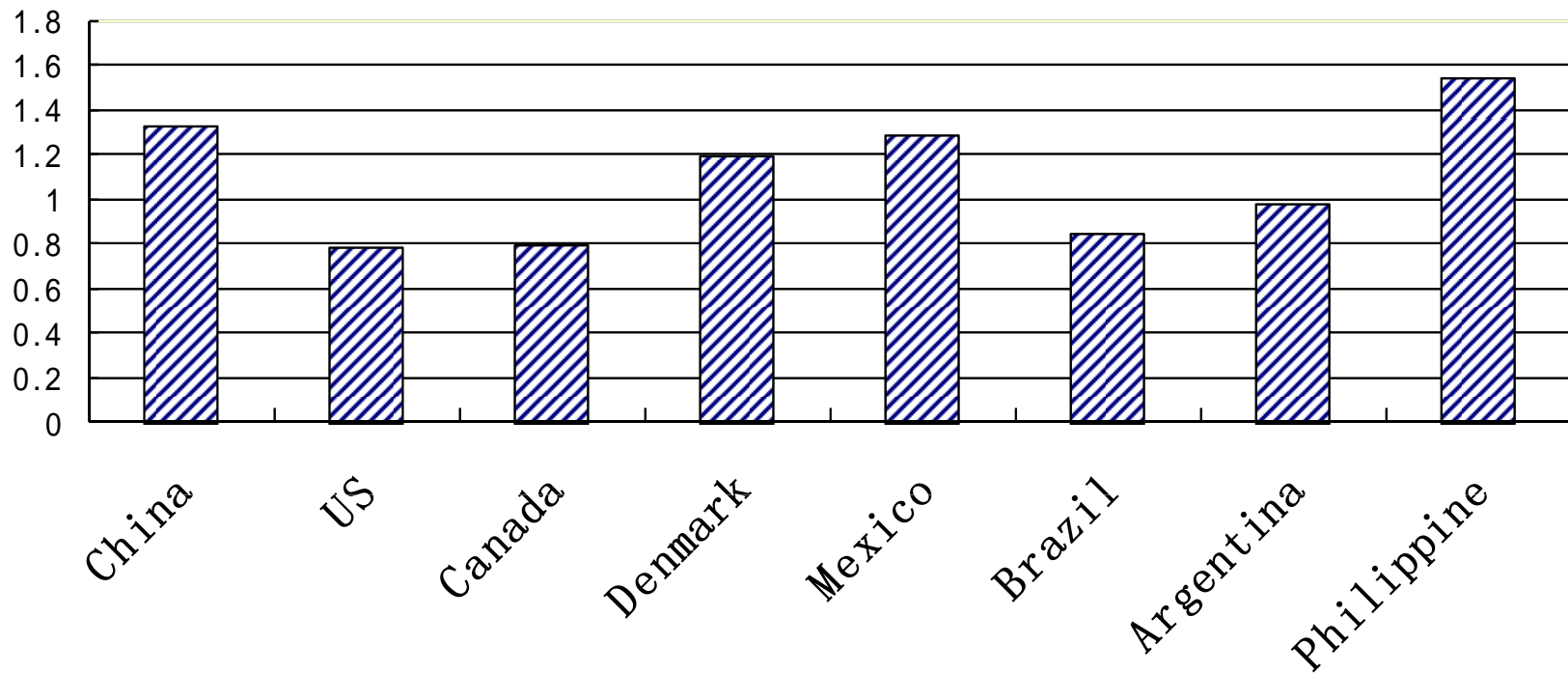
## **4. Lower efficiency in animal husbandry**

# FCR comparison

	Word advanced level	China advanced level
Broiler	1.6 : 1	1.8 : 1
Layer	2.3 : 1	2.4 : 1
Pig	2.6 : 1	3.0 : 1



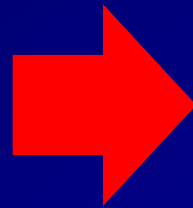
# Production cost of pork in different countries ( \$/kg )



# Feed safety & strategy



**Feed safety**



**Food safety**

# What is feed safety ?

- Feed ingredient safety
- Feed product safety
- Animal feeding safety
- Consumer safety
- Environment safety

# Factors affecting feed safety

- Artificial factors
- Natural factors
- Occasional accidents

# Artificial factors

- Addition of illegal drugs and additives
- Utilization of permitted feed additives & drugs beyond permitted ranges
- Disguise added materials to mislead consumers
- Risks from counterfeit feed products
- Utilization of animal protein in ruminant feed

# Natural factors

- **Natural toxic and hazardous substances in feed**
- **Moldy feed**
- **Heavy metal pollution**

# Occasional accidents

- **Cross contamination in feed processing**
- **Occasional pollution caused by toxic and hazardous substances in feed ingredients**



# Feed safety strategy

- **Governmental policy**
- **Enterprises participation**
- **Science driven – high, new and green technology**

# **Feed quality supervision & detecting system in China**

- **National Center for Feed Quality Control**
- **MOA Centers for Feed Quality Supervision and Testing (Shenyang, Jinan, Xi'an, Guangzhou, Nanning, Kunming)**
- **Provincial Agencies for Feed Quality Supervision and Testing**

# **Feed quality supervision & detecting items by MOA**

- **General feed safety: Detecting of nutrients and hygiene criteria**
- **Detecting of clenbuterol and ractopamine in feed and animal products**
- **Detecting of illegal additives : e.g. melamine etc**
- **Detecting of cattle, sheep & goat derived ingredients in ruminant feed**

# **Supervision and Management of Feed and Feed Additives**

- **Routine supervision and management**
- **Administrative law enforcement**
- **Reporting complaints**
- **Information feedback**
- **Urgent events**

# **Some Studies Related to Feed safety : examples**

- **Safe feed additives**
- **Feed quality control**

# Safe Feed Additives

- **Enzymes: phytase, xylanase, B-glucanase, lipase, etc**
- **Oligosaccharides**
- **Antimicrobial peptide**
- **Live microorganism**
- **.....**

**e.g. Fermentation capacity  
keep increasing**

**Xylanase:** 1500 5000

15000 40000

100000 170000 IU/mL

**Phytase:** 800 5000

10000 20000 30000 IU/mL

# Feed Quality Control

- **NIR fingerprinting in feed product differentiation**
- **NIR used in evaluation of feed processing quality**
- **.....**



# **Near Infrared Spectroscopy (NIR) Application**

- **Quantity analysis**
- **Quality analysis**
- **Quantity & quality**

# **NIR used in evaluation of feed processing quality**

- **Grinding particle size**
- **Uniformity of mixing**
- **Water content & hardness in pellet feed**
- **Starch gelatinization degree**



**THANK YOU**