京基智农 股票代码 000048
KINGKEY SMART AGRI

Application Practice of Precision Nutrition Technology in Multi-storey Pig Farming Pattern

Kuanmin Yang

PhD/Nutritional Director

Guangdong Kingkey Smart

Agriculture Times Co., Ltd.

October 20, 2023

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An Introduction to 6750 Multi-storey Pig Farming Pattern

Achievement of 6750 Multi-storey Pig Farming Pattern

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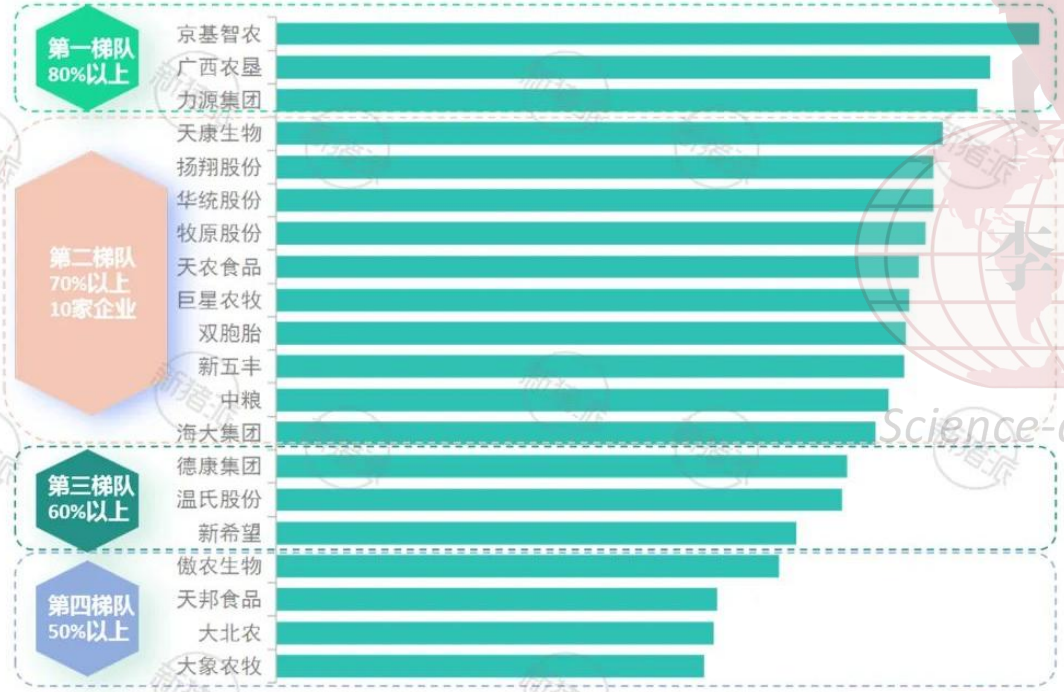
Laying the foundation for the company to quickly achieve full production potential, improve production efficiency and reduce breeding costs.

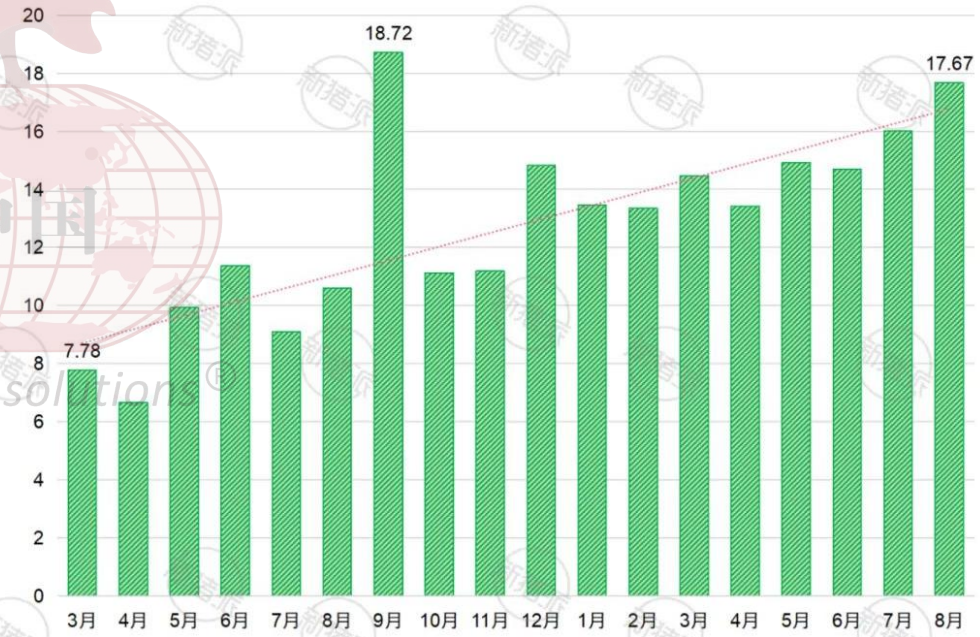
Capacity utilization rate of TOP20 pig enterprises in 2023



数据截至：2023年10月6日

数据来源：新猪派调研

Slaughter volume in the past year (10,000 pigs)

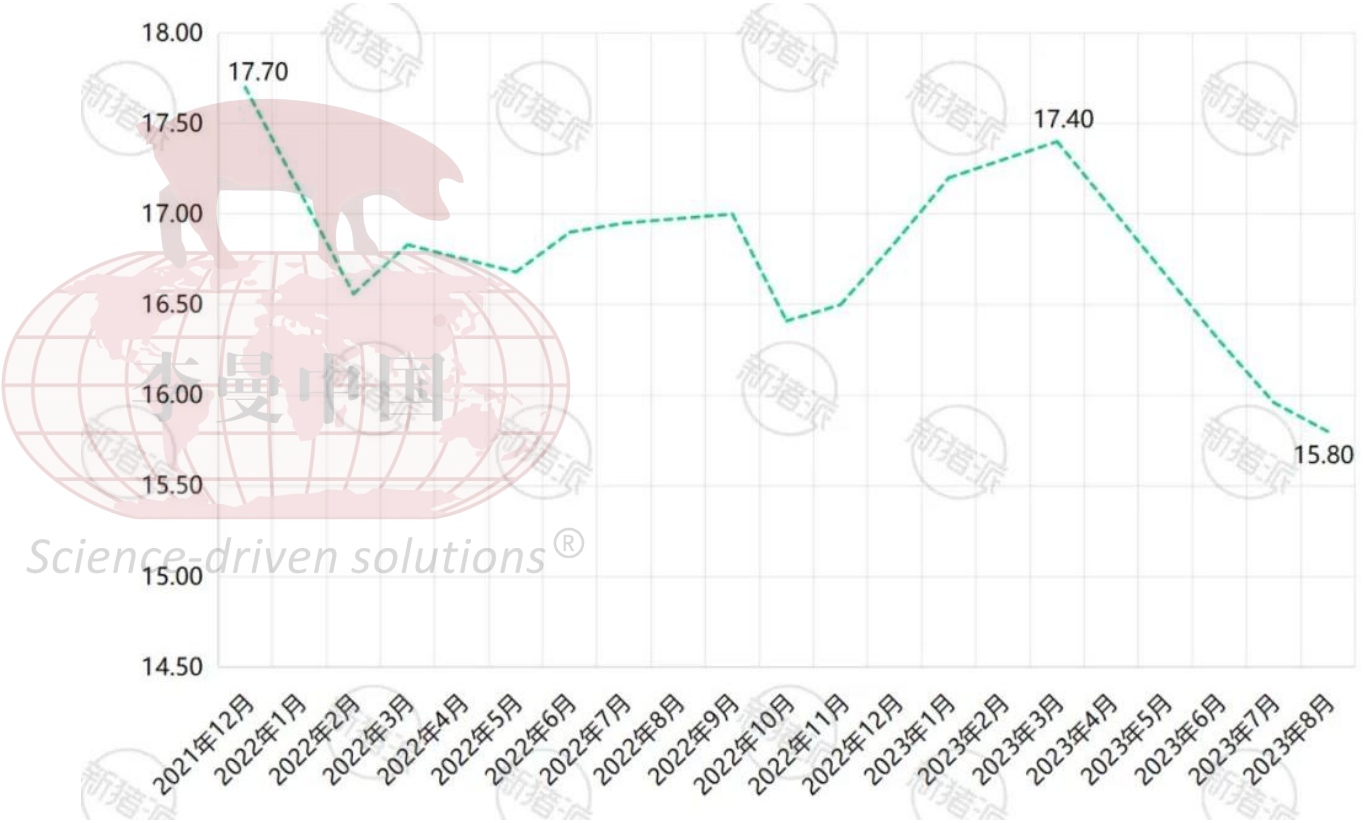


数据截至：2023年9月17日

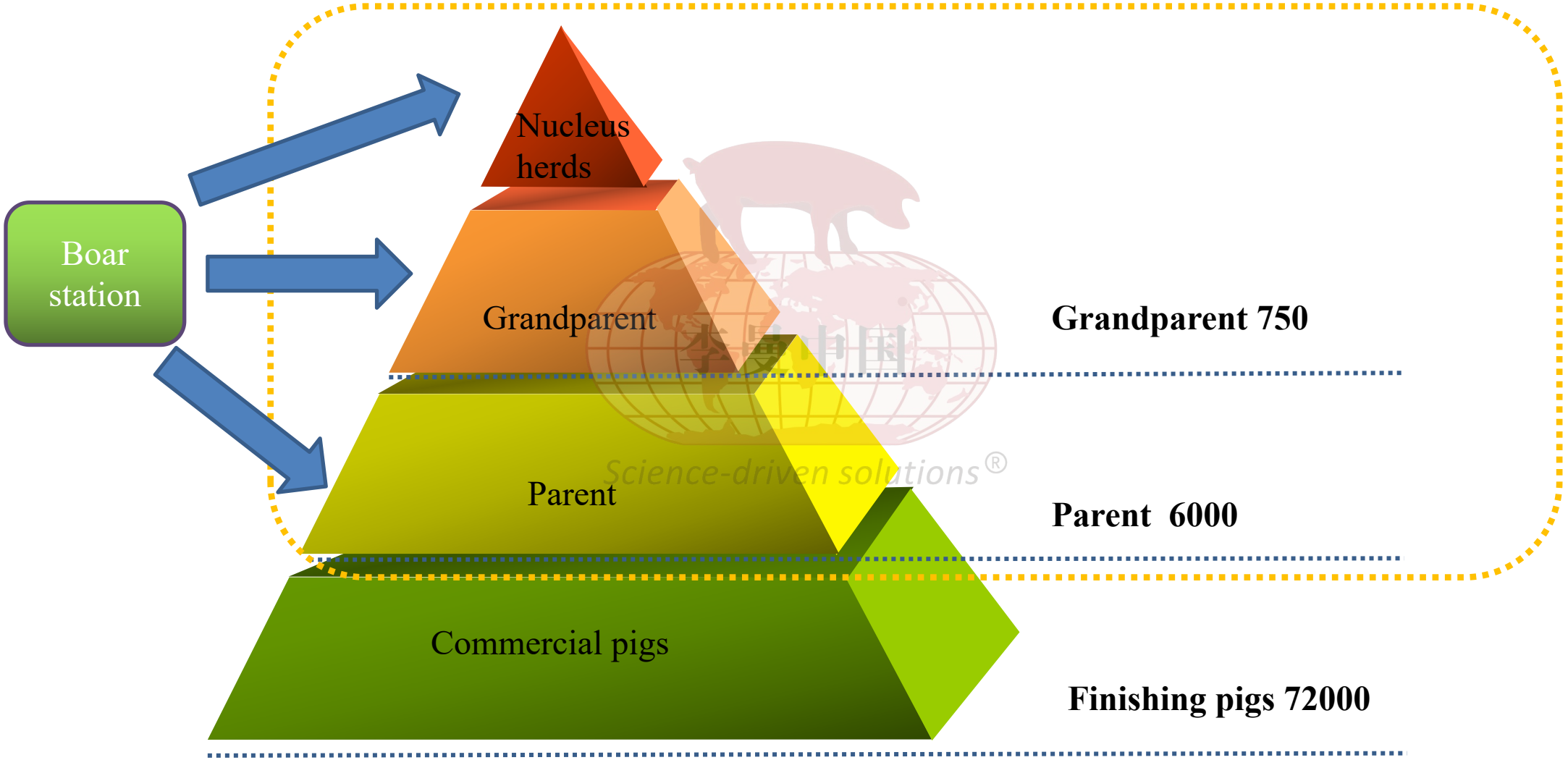
数据来源：公司公告、新猪派整理

Achieve full production potential and continue to reduce cost

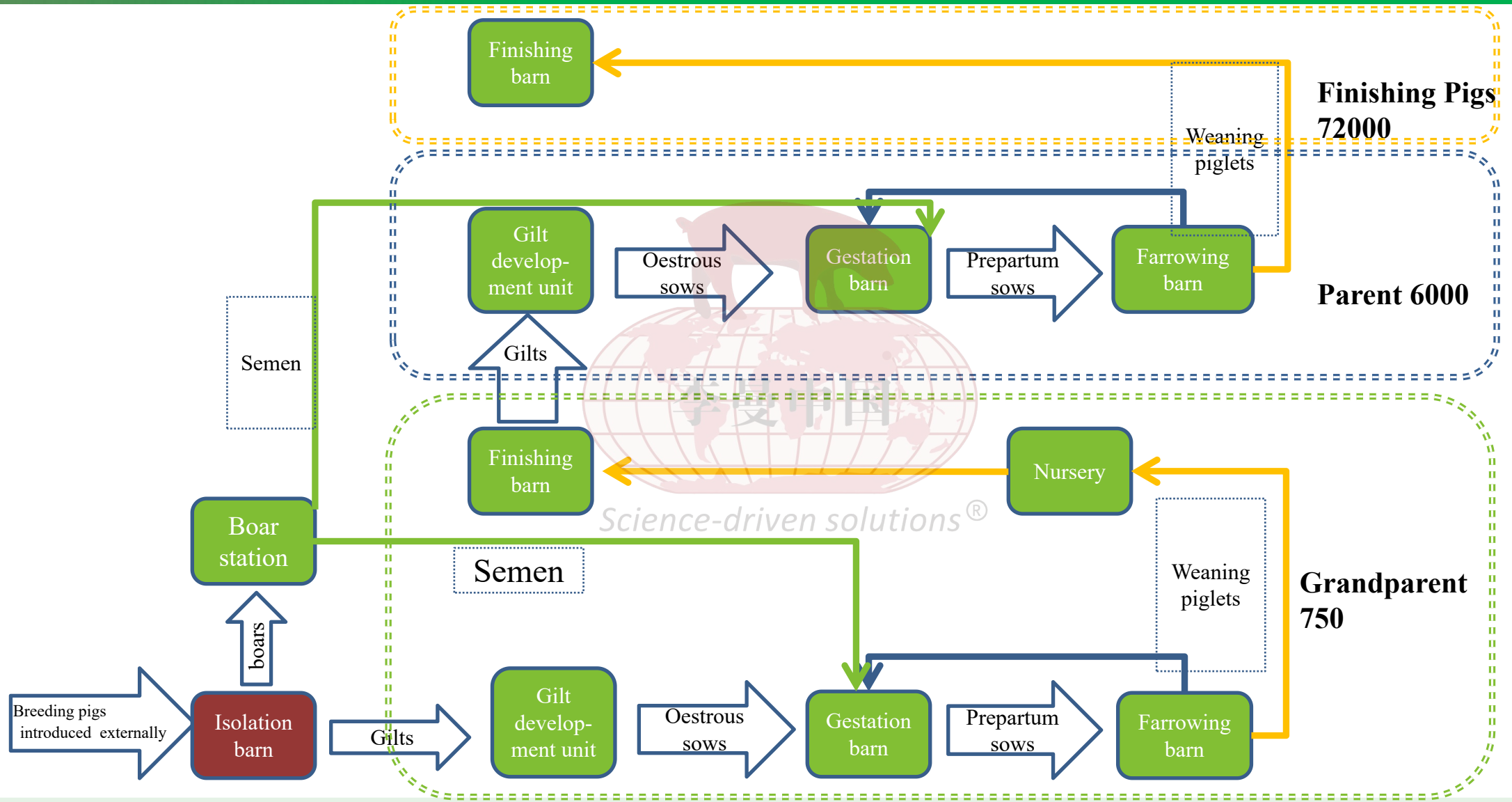
Company	Cost	Remarks（2023）
Muyuan Foods Co., Ltd.	14.73	September
Kingkey Smart Agr	15.8	August
New Hope	16.3	July
TECON	16.5	Year-end target
Shennong Group	16.6	June
Wens Foodstuff Group	16.8	April
Kingsino Technology Co.,Ltd.	16.93	July
Dongrui Foods	17.8	August
Dabeinong Technology Group	18.76	Quarter 1
Tech-bank Food Co., Ltd.	19-20	Quarter 1

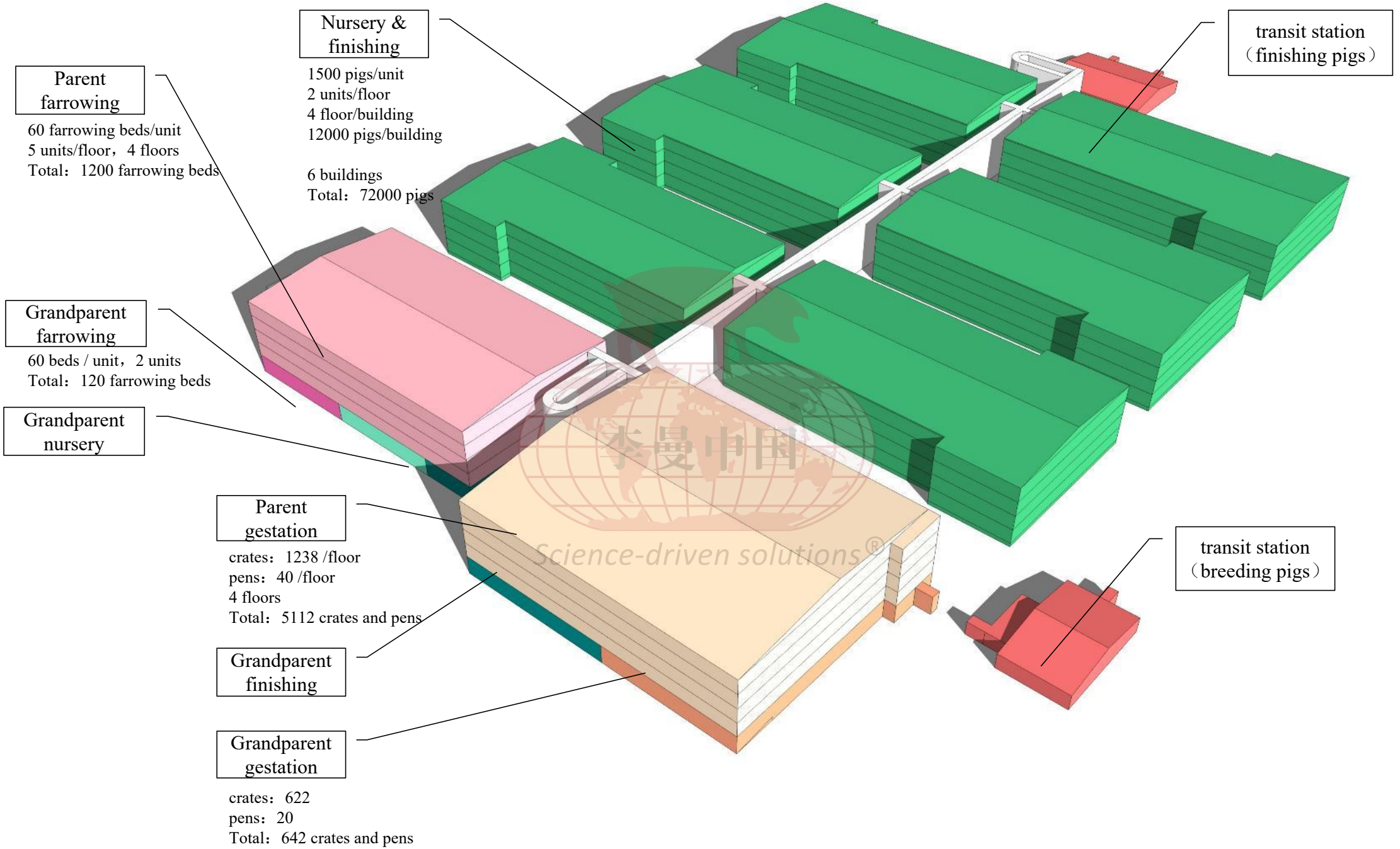


Breeding system of 6750 pattern



Production process




Nursery & finishing
1500 pigs/unit
2 units/floor
4 floor/building
12000 pigs/building
6 buildings
Total：72000 pigs
transit station（finishing pigs）
Parent farrowing
60 farrowing beds/unit
5 units/floor，4 floors
Total：1200 farrowing beds
Grandparent farrowing
60 beds / unit，2 units
Total：120 farrowing beds
Grandparent nursery
Parent gestation
crates：1238 /floor
pens：40 /floor
4 floors
Total：5112 crates and pens
transit station（breeding pigs）
Grandparent finishing
Grandparent gestation
crates：622
pens：20
Total：642 crates and pens
Science-driven solutions®

4-5 floors 6750---Integration of breeding facilities

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Breeding（6750）			Finishing (72000)					
	The 1st building	The 2nd building		The 1st building	The 2nd building	The 3rd building	The 4th building	The 5th building	The 6th building
The 5th floor	1500 farrowing room 5	1500 gestation 3							
The 4th floor	1500 farrowing barn 5	1500 gestation 3	The 4th floor	3000	3000	3000	3000	3000	3000
The 3rd floor	1500 farrowing barn 5	1500 gestation 3	The 3rd floor	3000	3000	3000	3000	3000	3000
The 2nd floor	1500 farrowing barn 5	1500 gestation 3	The 2nd floor	3000	3000	3000	3000	3000	3000
The 1st floor	750 farrowing barn 2+nursery 2+finishing 1	750 finishing 3+gestation 2	The 1st floor	3000	3000	3000	3000	3000	3000

6750 Production Pattern

	grandparent 750 area/parent 1500 area
	4-week batch
Breeding cycle	20W（140 days）
Days of lactation	21 days
Number of batches	5
Days of using the farrowing unit	4W
Number of batches in farrowing barn	1
Number of batches in gestation barn	4

Types of batches	Interval between batches	Interval between breeding	Moving to farrowing bed earlier	Farrowing time	Age of lactation	Washing	Empty pens	Weaning batches /year	Number of batches of pig herds on the farm	Pigs in nusery and finishing barns	Washing empty pens
4-week batch	28 days	3-5 days	3	2	21	2		13	5	161	7

6750 advantages and management stress

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Advantages：

v Closed herd production: self-renewal of breeding pigs to reduce biosafety risks

v All-in all-out： All-in all-out of the whole building（12000 pigs/batch）

v 4-week batch production organisation： improve the health of pigs, save manpower, improve efficiency and reduce cost

Management stress：

- ◆ High production management intensity and requirements；
- ◆ High requirement of nutrition matching: the feeding days are only 161 days, and the daily gain needs to be more than 700 g.
- ◆ Huge environmental pressure: intensive, highly efficient with low emissions.

Low Cost, Low Emission,

High Efficiency

-- Precision Nutrition

Technology System

2

Sharing of Application Practice of Precision Nutrition Technology

Precision Nutrition Technology System

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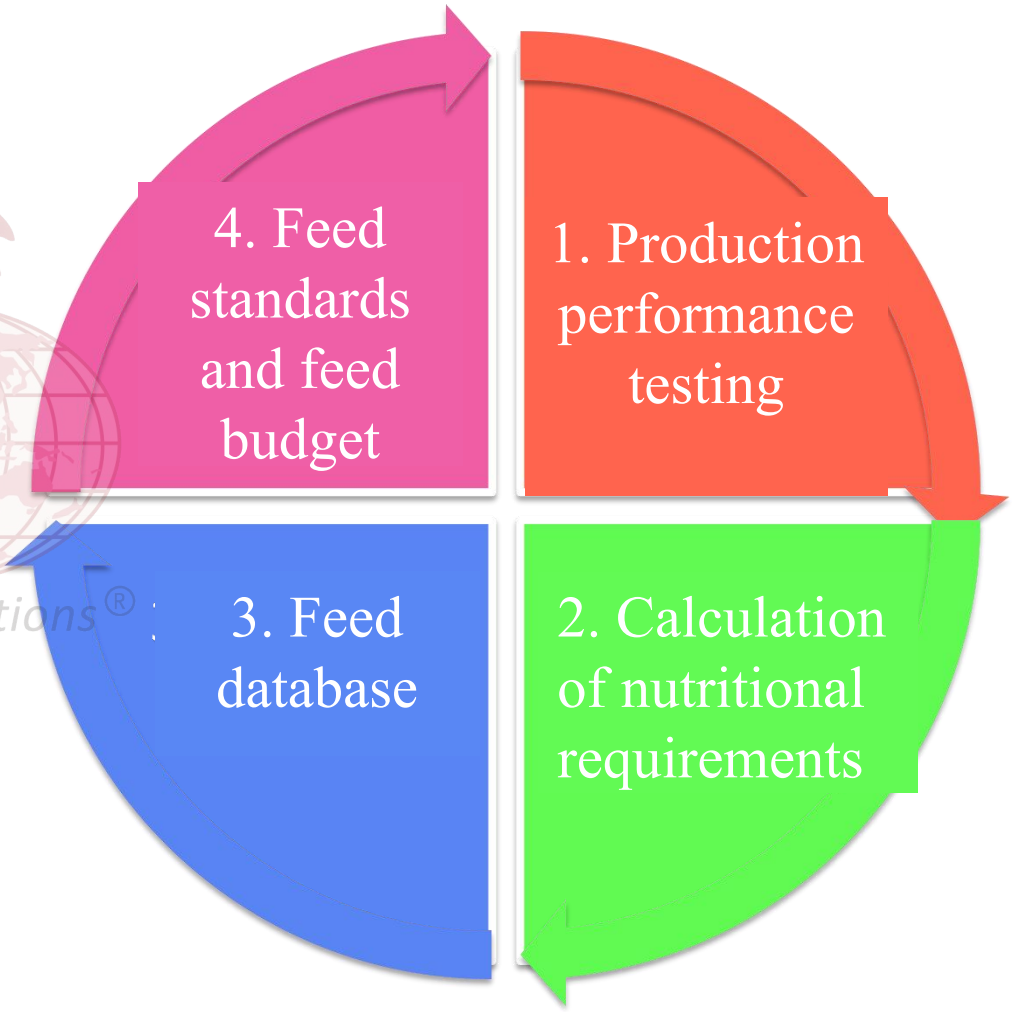
Precision feed nutrition data

Dynamic nutrient requirement model

Precise nutrition supply technology



1）Nutritional standard: whether to meet the nutritional requirements of different strains under the 6750 pattern;

2）Feed budget: whether the nutrient supply meets the growth potential of different breeds under the 6750 model；

3）Cost optimization: whether there is room for further optimization of the cost of feed for meat production;

4）After-sales market: market feedback on carcass performance and pork quality needs data support.

★Purpose：Explore the growth potential of PIC and French pigs under the 6750 multi-storey breeding pattern?

Determination of feed intake and weight-formulation of nutrition supply plan-feed nutrition standard-feeding budget

★Targets：

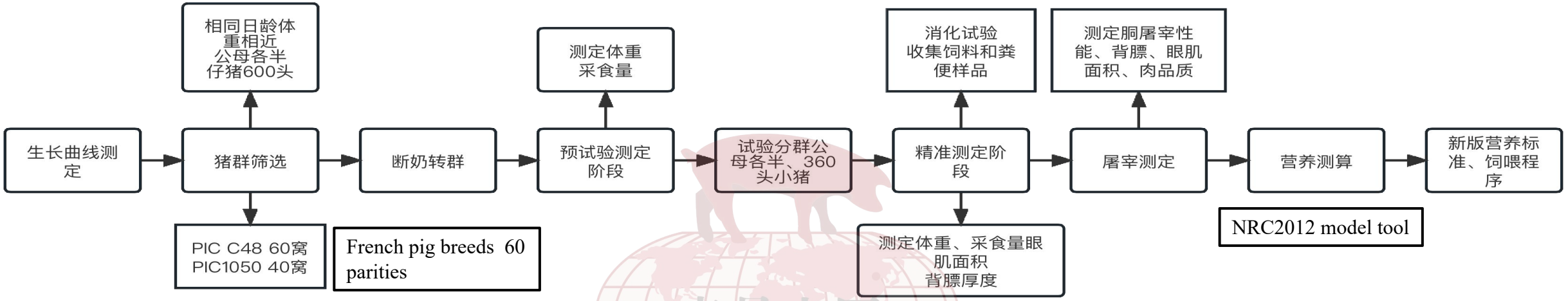
1、The growing pattern of PIC and French pig breeds under 6750 pattern；

2、Revise the nutrition standards of PIC and French pig breeds under 6750 pattern;

3、Revise the feed budget standards of PIC and French pig breeds under 6750 pattern；

4、Reduce FCR by 0.1 and the feed-to-meat cost 30 yuan/pig；

Project implementation route



Design and methods

Principle: Select 600 weaned piglets of the same batch, the same age, similar weight, half male and half female （PIC C48 progeny 400 pigs， PIC1050 progeny 200 pigs）；

PIC C48 ♀ (40 parities） X PIC 800 ♂

↓

Commercial pigs（three-way crossbred）400 pigs,half male and half female

1、Pre-test phase: 600 pigs, 50 pigs in each pen; measure weight and feed intake; collect feed and feces samples, and record daily management measures;

Distribution map of experimental pig pens in the pre-experiment phase

PIC 1050 ♀ (20 parities） X PIC 800 ♂

↓

Commercial pigs（three-way crossbred）200 pigs,half male and half female

2、Precise measurement phase: 360 pigs, 20 pigs in each pen; measure the weight, feed intake, backfat and eye muscle area; collect feed and feces samples, and record daily management measures;

Distribution map of experimental pig pens in the precise determination phase

Measurement Results-Growth Performance

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➢ Results of different phases & Cumulative Results--PIC pigs

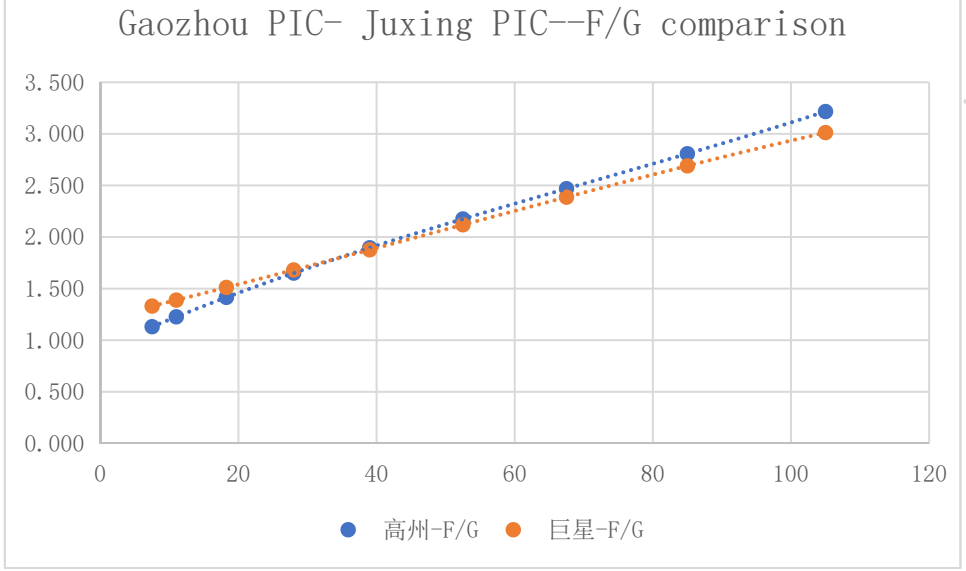
Age/day	Feeding phase	Days of feeding	Phased feed intake（kg）	Weight gain（kg）	Daily feed intake（kg/day）	Daily weight gain（g/day）	FCR
21- 35	6.6-8.5	14	2.54	1.87	0.181	134	1.36
36- 54	8.5-15.9	19	9.63	7.40	0.507	390	1.30
55- 70	15.9-28.1	16	18.33	11.08	1.146	692	1.65
71- 91	28.1-48.2	21	36.32	20.13	1.729	959	1.80
92- 112	48.2-68.7	21	47.63	20.43	2.268	973	2.33
113- 133	68.7-84.0	21	46.92	15.32	2.234	730	3.06
134- 154	84.0-108.8	21	74.85	24.83	3.56	1183	3.01
155- 182	108.8-138.6	28	109.40	29.87	3.91	1067	3.66
21- 182	**Actual measurement**	**161**	**345.61**	**130.94**	**2.15**	**813**	**2.64**
21- 174	**Estimation**	**153**	**275.50**	**108.50**	**1.80**	**709**	**2.54**
21- 174	**Actual measurement（corrected）**	**153**	**311.2**	**123.0**	**2.03**	**804**	**2.53**
100kg weight gain	**Actual measurement**	-	-	-	-	-	**2.33**
	Estimation	-	-	-	-	-	**2.46**

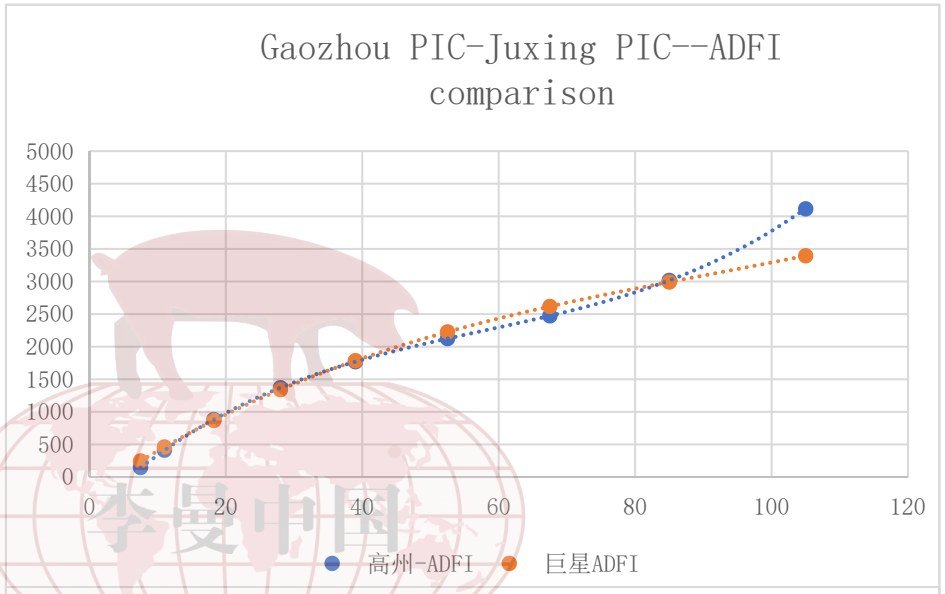
1、Compared with the estimated results, the daily feed intake increased by 230 g /day and the daily weight gain increased by 95 /day;

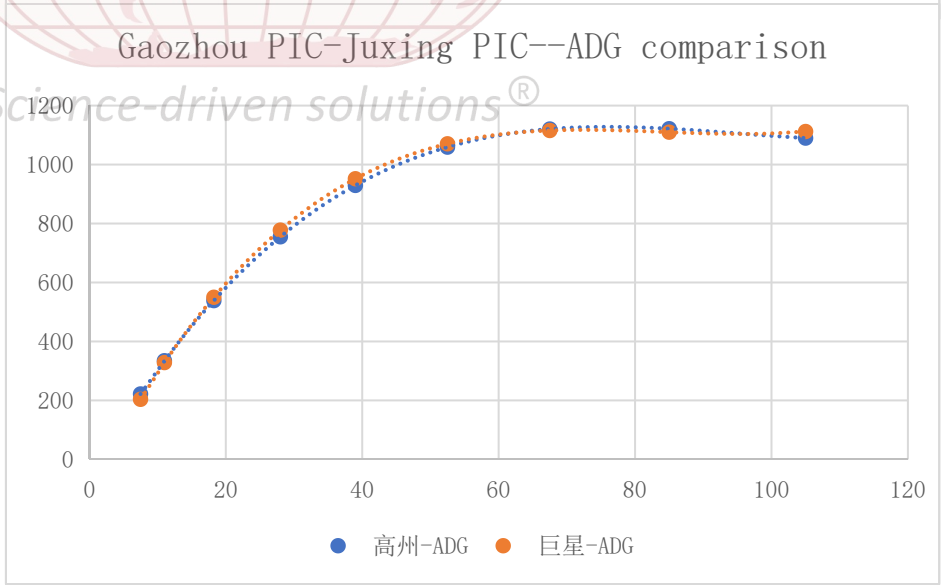
2、The FCR of the actual measured weight gain of 100 kg is lower than the estimation by 0.13;

➢ Comparison of pig enterprises

Age/ weight	budgeet	Actual measurement in Gaozhou	PIC337	PIC399	Juxing Agri. & Animal Husbandry
70	26.9	28.1	29.1	28.9	26.4
91	42.1	48.2	46.8	46.3	45.1
112	59.5	68.7	66.8	65.6	66.7
133	78.1	84.0	87.6	85.6	90.0
154	97.4	108.8	108.3	105.2	113.8
182	116.6	138.6	134.2	129.6	144.2







1. Compared with pic standard growth curve data and data from Juxing Agriculture and Animal Husbandry Co., Ltd. , the results are very close.

2. In fact, we were affected by severe viral diarrhea between 112-133 days of age, which caused at least 5-8 kg of weight gain. If we were not affected, our measured data might be better than its results.

Growth performance result of French pig breeds

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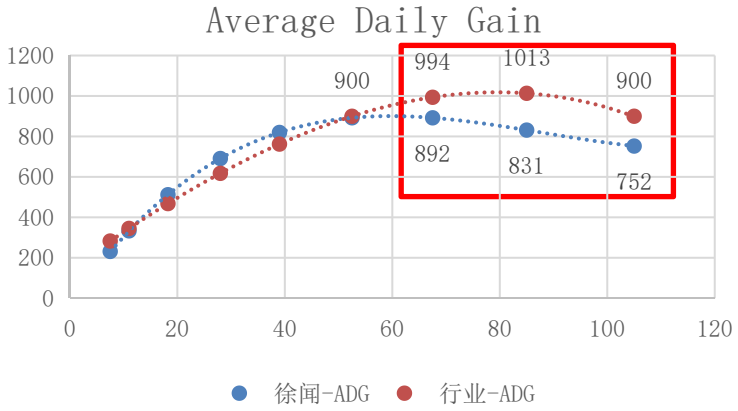
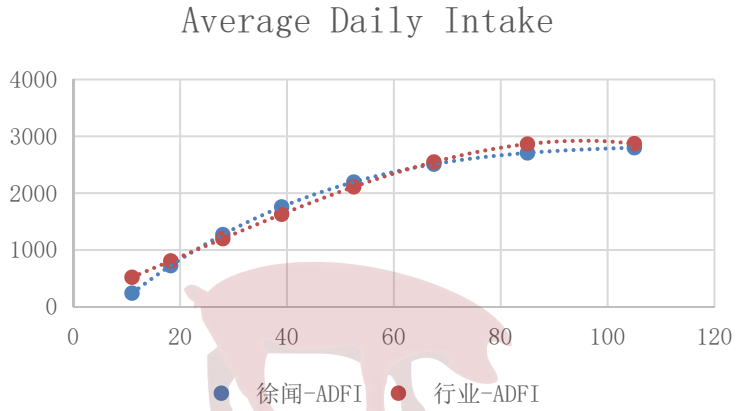
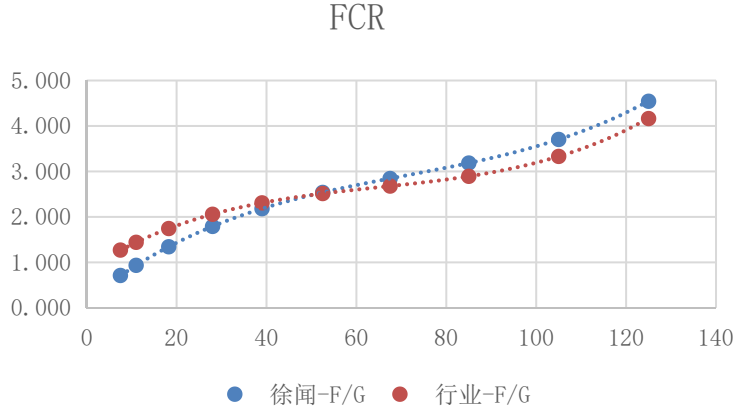
Age phase	Weight phase	Average feeding days	Phased feed intake（kg）	Phased Weight gain（kg）	Average Daily Intake（kg/day）	Average Daily Gain（g/day）	Feed Conversion Ratio
23-37	7.0-10.2	14	2.74	3.15	0.2	225	0.87
38-51	10.2-17.1	14	8.84	6.93	0.63	495	1.28
52-71	17.1-31.4	20	21.55	14.31	1.1	728	1.51
72-91	31.4-48.9	20	36.85	17.46	1.81	859	2.11
92-112	48.9-65.9	21	48.59	17.03	2.31	811	2.85
113-133	65.9-83.2	21	54.15	17.22	2.58	820	3.14
134-154	83.2-101.2	21	58.58	18.09	2.79	861	3.24
155-179	101.2-119.2	25	70.03	17.9	2.8	716	3.91
Culmulative calculations	Actual measurement	156	301.3	112.1	1.93	719	2.69
	budget	153	294.5	108.5	1.92	709	2.71
Corrected to 100 kg weight gain	Actual measurement			100			2.57
	budget			100			2.63

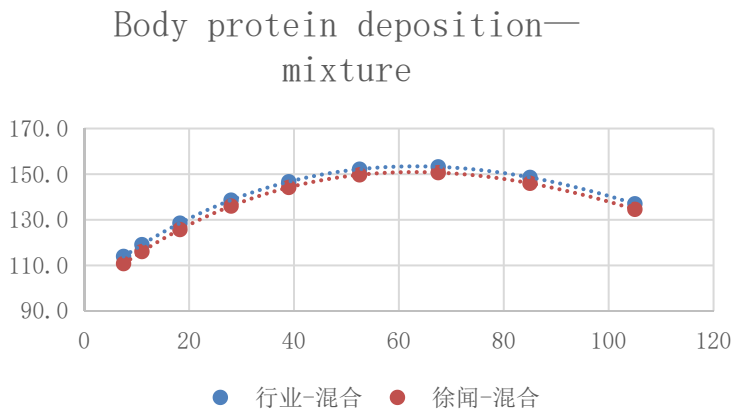
- Compared with the budget standard, the feeding days and the average daily feed intake were close, and the measured average daily gain in Xuwen farm was increased by 1.41%;
- Corrected to the FCR of 100 kg weight gain, and the actual measurement was 0.06 lower than the budget;

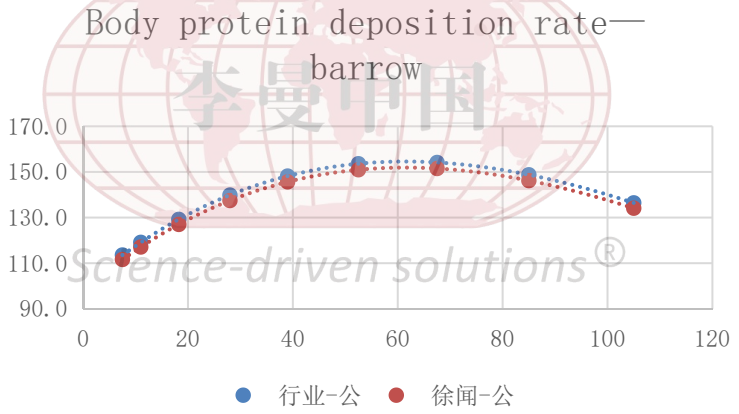
Benchmarking data of Industry and French pig breeds

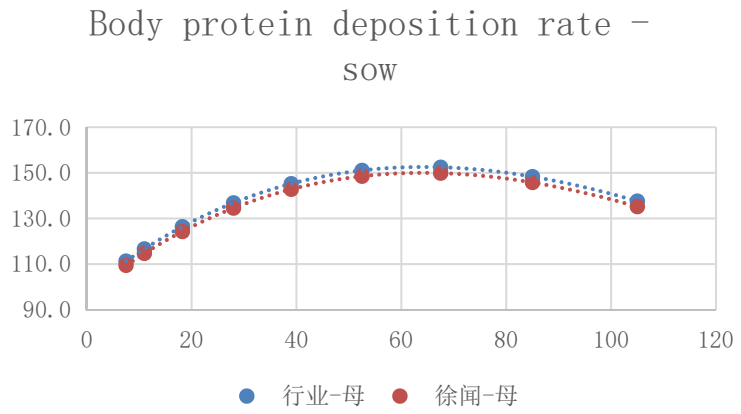






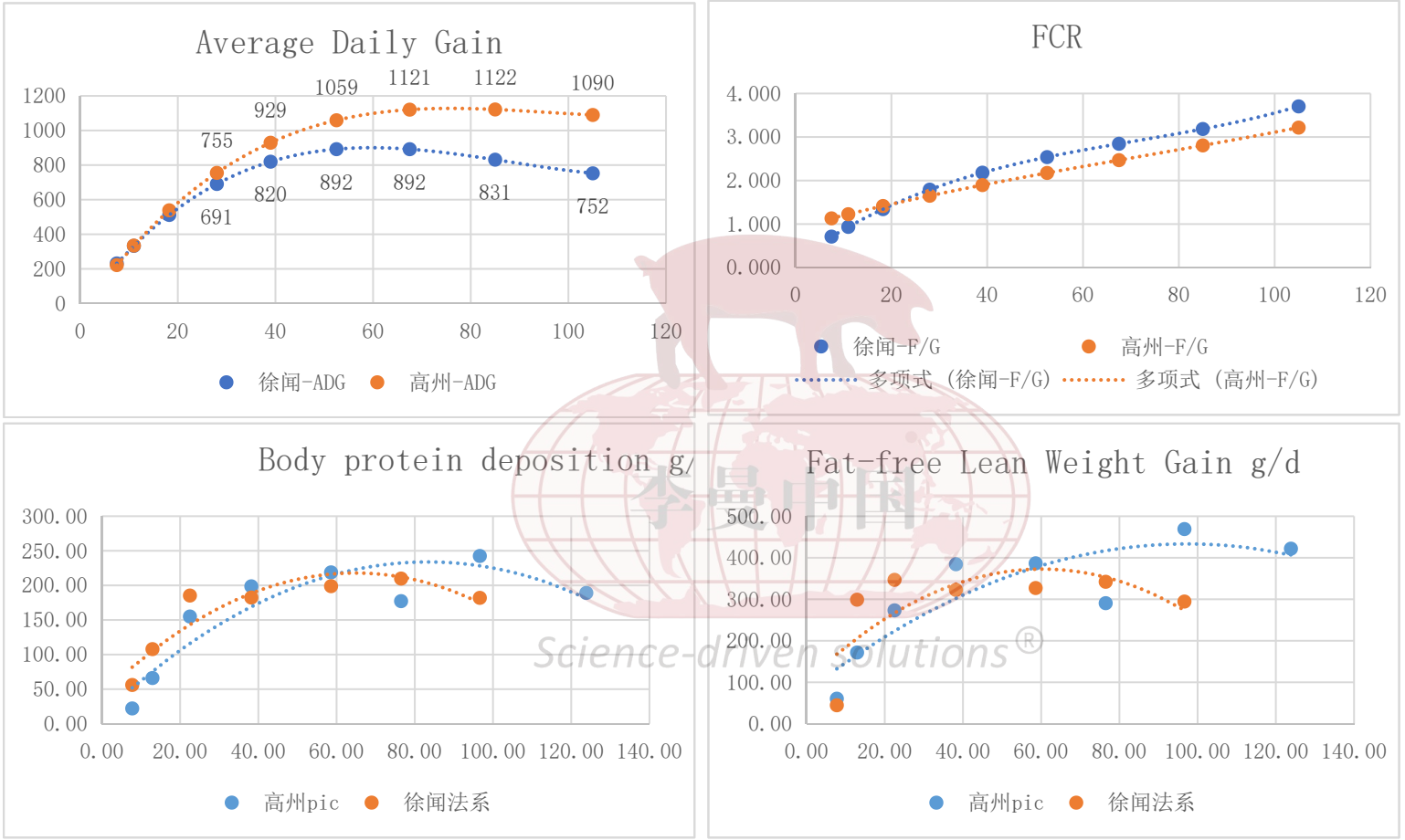






- The curve trends of feed intake, feed conversion ratio and body protein deposition rate of Xuwen Farm were basically consistent with the data of the same industry.
- At the phase of 45-60 kg weight (95 days old), the average daily gain curve of Xuwen farm began to deviate from the same line curve.
- Combined with the budget comparison data, the measured daily gain of French pig breeds in Xuwen Farm can be increased by 10% -20% without the influence of stress on the health of pigs.

Comparison between French pig breeds and PIC



- After entering the growing and finishing stage, the daily gain of French pig breeds began to be significantly lower than that of PIC pigs, and the greater the weight, the greater the gap.
- The deposition of fat-free lean meat and body protein in French pig breeds and PIC pigs were completely different, and the deposition of PIC pigs was significantly higher than that in French pigs after 60 kg.
- At present, a set of nutritional standards and feeding procedures can not fully cover the nutritional needs of multiple breeds.

➢ Comparison of pigs of different genders-PIC

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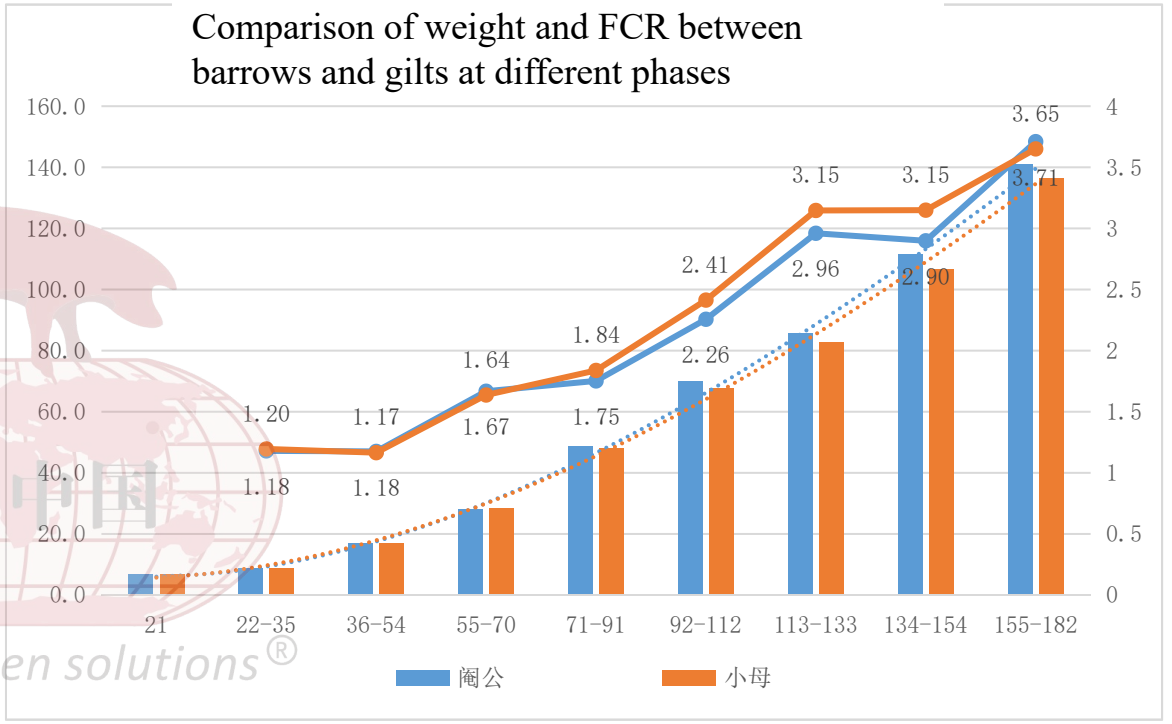
	Barrow	Gilt	P Value
Initial Weight/kg	6.68±0.38	6.67±0.35	0.65
Final Weight /kg	140.97±12.14**	136.41±12.67	0.00
Daily Feed Intake/kg	2.15±0.06	2.15±0.06	0.92
Daily Gain g	834±74.8**	806±78.4	0.00
Feed Conversion Ratio (FCR)	2.59±0.24**	2.69±0.26	0.00

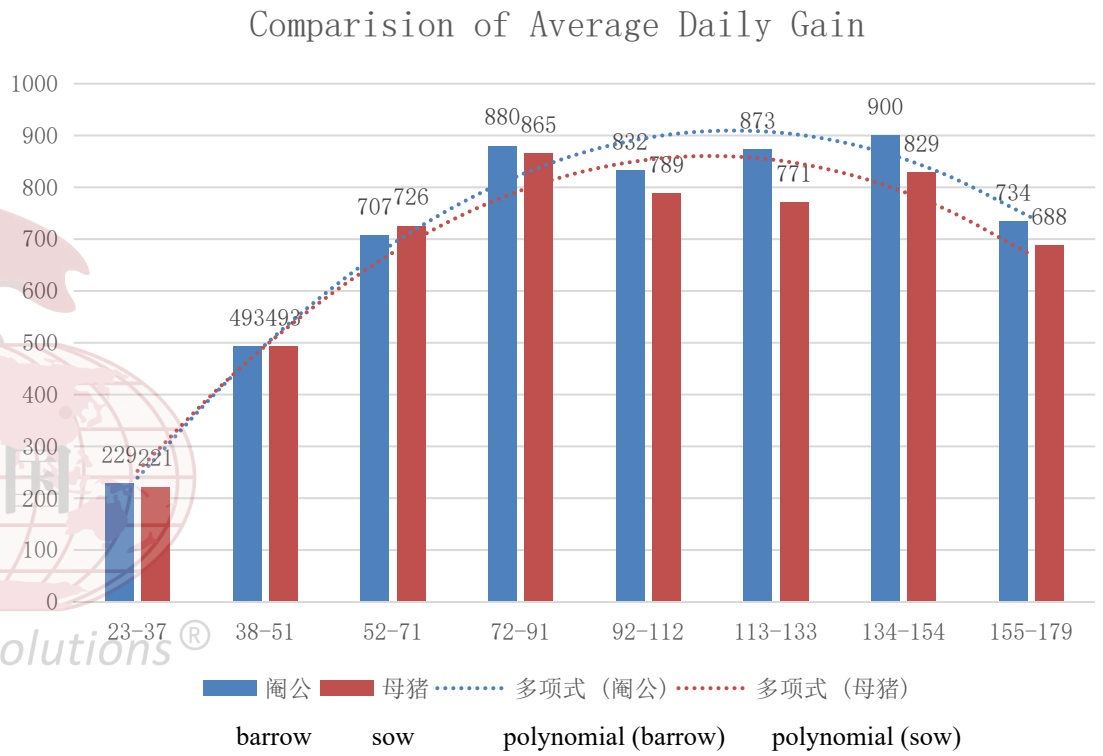


1、Compared with gilts, barrows were significantly better in terms of slaughter weight, ADG and FCR（slaughter weight is higher by 4.6 kg， ADG is higher by 28 g/day， FCR is lower by 0.1）；

2、After 90 days of age, barrows were heavier than gilts at all phases, and the gap in FCR increased；

➢ Different genders - French Pig Breeds

	Barrow	Sow	P Value
Initial Weight（kg）	7.0±0.51	7.1±0.47	0.590
Final Weight（kg）	121.9±10.4**	116.3±11.18	0.000
Average Daily Gain（g/pig/day）	737±66.3**	701±72.3	0.000
Average Daily Feed Intake（kg/pig/day）	1.92±0.05	1.92±0.05	0.900
FCR	2.63±0.23**	2.77±0.29	0.000

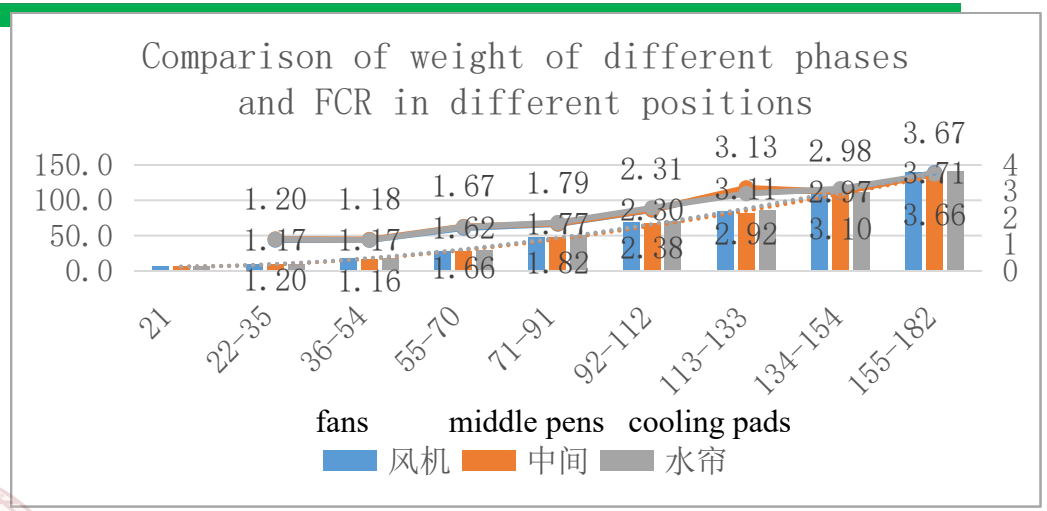


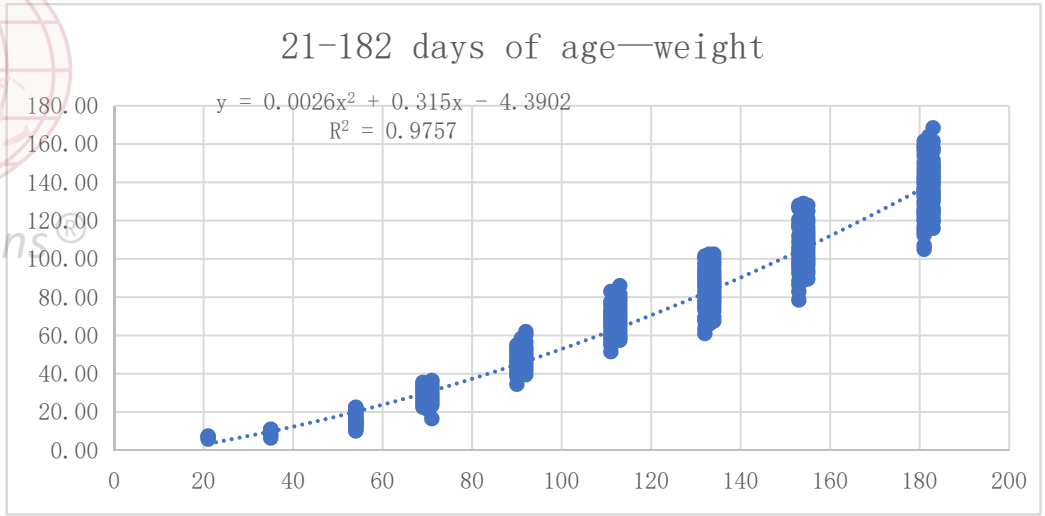
- At the age of 179 days, the average daily gain and FCR of barrows were significantly better than those of sows ($P < 0.05$), and the average weight for slaughter was 4.8% higher than that of sows.
- There was no significant difference in weight gain between barrows and sows in the nursery stage (23-71 days of age), and the barrows had a significant advantage in growth speed in the growing-finishing stage (72-179 days of age).

➢ Contrast of different position--PIC

	Near Fans	Middle Pens	Near Cooling pads	P Value
Initial Weight（kg）	6.70±0.32	6.67±0.31	6.65±0.45	0.68
Final Weight（kg）	138.97±12.25*	135.47±11.80	141.54±13.05*	0.01
Daily Feed Intake/kg	2.15±0.05**	2.09±0.01	2.20±0.05**	0.00
Daily Weight Gain g	822±75.6*	800±72.9	838±80.5**	0.01
Feed Conversion Ratio	2.63±0.25	2.64±0.24	2.65±0.26	0.84

Age/day	21	35	54	54	70	91	112	133	154	182
n /pig	600	598	580	360	359	358	357	356	351	348
Weight/ kg	6.63	8.5	15.92	17.01	28.1	48.21	68.66	83.98	108.81	138.69
SD	0.33	0.85	2.33	1.77	3.12	5.03	6.76	9.55	10.97	12.58



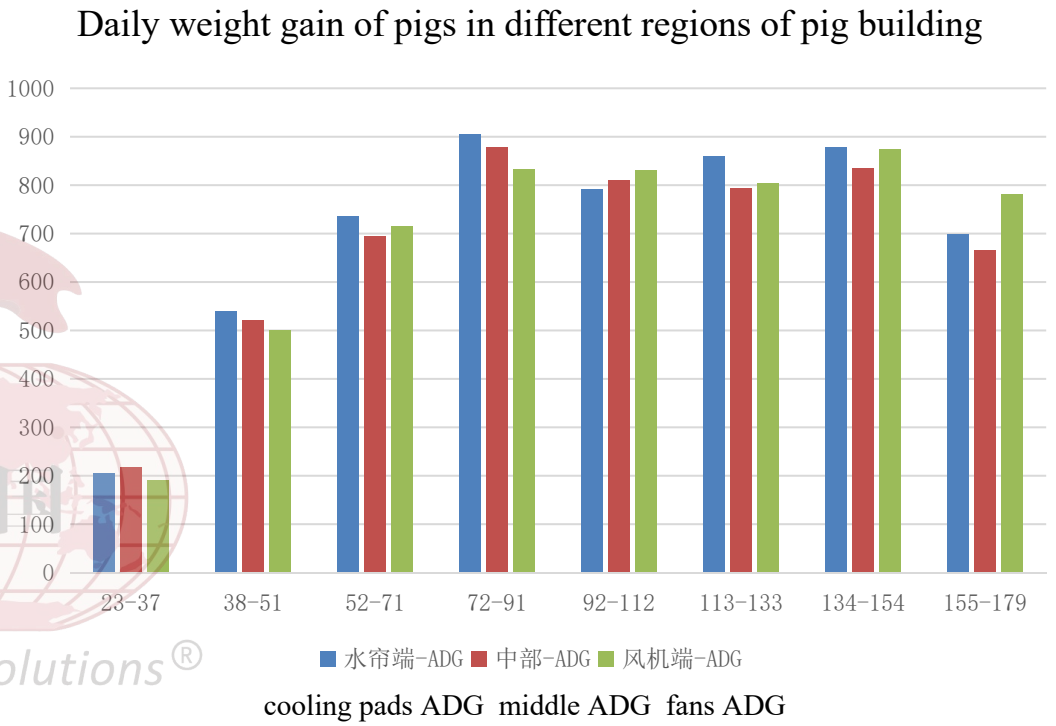


1、The growth rate of pigs near the cooling pads and fans was better than that in the middle pens, showing individual differences;;

2、Compared with the measured results of the growth curve of Gaozhou Farm, the difference between 21-50 days of age is not large, but with the increase of weight, the individual difference increases, and the uniformity becomes worse——**selling pigs in batches**

➢ Comparison of different positions--French pig breeds

	Near Cooling pad	Middle	Near Fans	P-Value
Initial Weight（kg）	7.0±0.46	7.1±0.49	7.0±0.52	0.092
Final Weight（kg）	120.7±12.07*	116.7±10.62	119.9±10.3*	0.015
Daily Weight Gain (g/pig/day)	730±77.52*	704±68.67	724±66.26*	0.013
Daily Feed Intake (kg/pig/day)	1.96±0.03**	1.92±0.06*	1.89±0.04	0.000
FCR	2.72±0.29	2.75±0.27	2.63±0.25*	0.004



- The growth rate of pigs near the cooling pads and fans was significantly higher than that of the middle pens in the pig building;
- The data of wind speed and temperature in different regions were subsequently measured to establish the correlation analysis with the growth rate of pigs.

Test Results-Slaughter Performance（PIC vs French pig breeds）

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	French pig breeds	PIC-1050	PIC-C48	P Value
dressing percentage/%	83.00±1.41	82.81±1.79	83.64±3.85	0.086
Lean meat percentage /%	57.3±2.93^{b}	61.92±1.46^{a}	61.1±2.15^{a}	0.000
fat percentage/%	19.39±4.32^{a}	15.32±0.79^{b}	16.44±2.11^{b}	0.010
skin percentage/%	6.46±0.82^{b}	7.52±1.03^{a}	7.38±1.25^{a}	0.019
bone percentage /%	16.84±1.52^{a}	15.24±0.76^{b}	15.08±0.87^{b}	0.001

- Lean meat percentage and skin percentage of French pig breeds were significantly lower than those of PIC pigs, fat percentage and bone percentage of French pig breeds were significantly higher than those of PIC pigs, and fat deposition rate of French pig breeds was significantly higher than that of PIC pigs.

Comparison of slaughter meat quality between French pig breeds and PIC

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	French pig breeds	PIC-1050	PIC-C48	P Value
pH-1h	6.28±0.22	6.24±0.27	6.27±0.26	0.845
pH-24h	5.58±0.1^{b}	5.61±0.14^{ab}	5.66±0.14^{a}	0.003
NPB neat color	3.10±0.53^{b}	3.81±0.62^{a}	3.65±0.73^{a}	0.000
brightness	47.28±2.22^{a}	42.85±3.15^{b}	43.05±2.60^{b}	0.000
redness	6.47±0.92^{a}	6.22±1.19^{ab}	5.91±1.09^{b}	0.014
yellowness	1.83±0.83^{b}	2.78±1.27^{a}	2.86±1.21^{a}	0.000
drip loss	4.25±0.64	4.53±1.40	4.22±1.21	0.417
cooking loss	19.23±2.54^{b}	21.05±5.07^{a}	19.12±3.73^{b}	0.046
shear force	68.67±14.92	70.53±14.78	67.18±13.51	0.577
marbling	1.17±0.48^{b}	1.52±0.53^{a}	1.43±0.52^{a}	0.001

- The pH value, brightness and redness in 24 hours of French pig breeds pork were significantly better than those of PIC pigs, and the cooking loss was significantly lower than that of PIC-1050 breeds pigs. French pig breeds had better meat color and water holding capacity. However, the marbling score of French pigs was significantly lower than that of PIC pigs, the intermuscular fat content was significantly lower, and the tenderness decreased.

Value determination of precise nutrition

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- **Technical value**

  1、Determine the weight gain and feed intake data of PIC and French pig breeds, and reduce FCR；

  2、Calculate the nutritional requirements of PIC and French pig breeds under the 6750 pattern and revise the new nutritional standards ；

  3、Calculate the growth pattern of PIC and French pig breeds under the 6750 pattern and revise the new version of feed budget standards for the nursery and finishing stage;

- **Economic value**

  1、Through accurate calculation and revision of nutritional standards and feed budget, the cost of feed-to-meat production can be reduced. The cost reduction for PIC and French pig breeds are 50 and 29 yuan per head, respectively.

- **Social value**

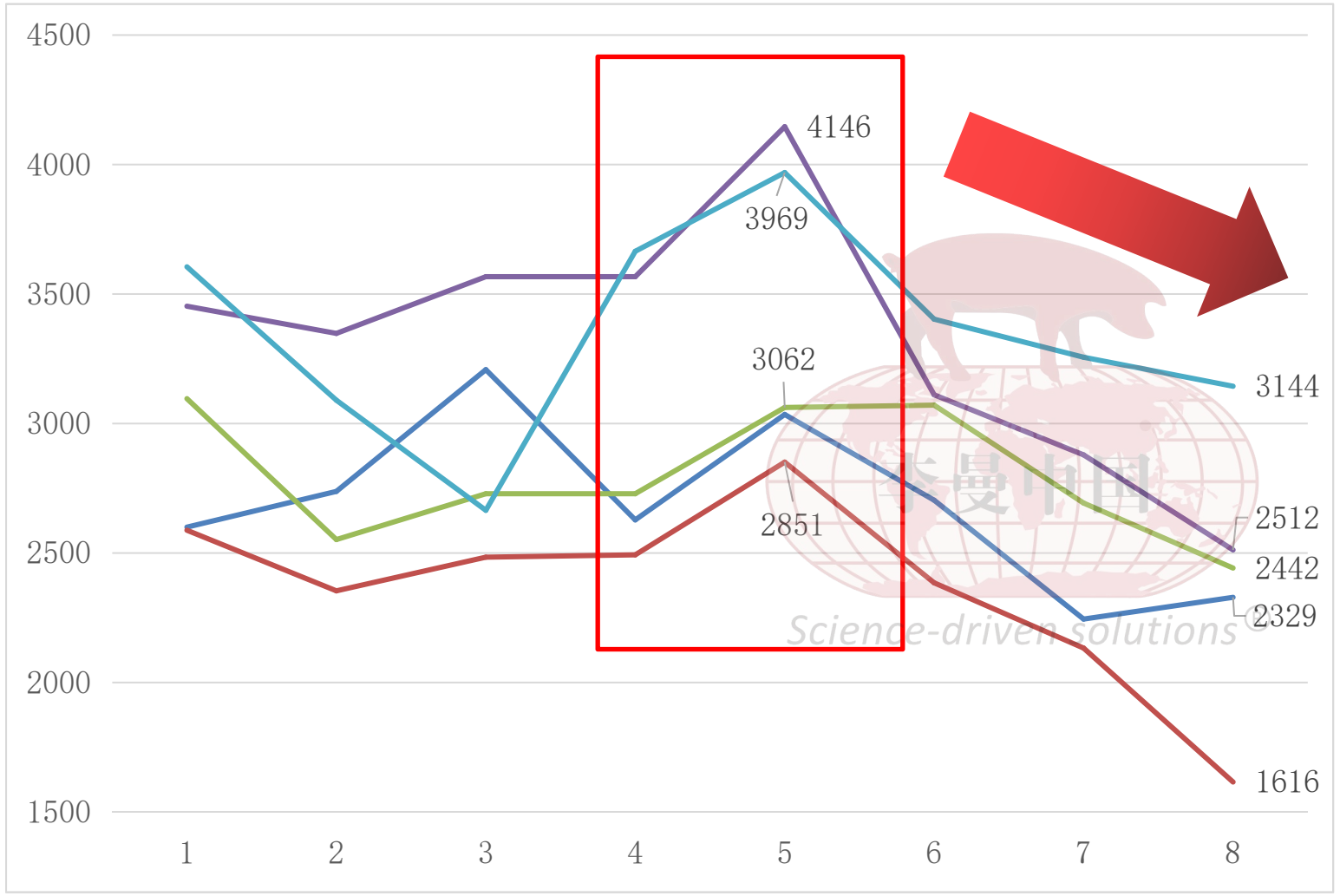
- 1、It has the effect of emission reduction from the source and reduces the pressure on the environmental protection.

Economic benefit analysis of different dietary net energy levels

Feed No.	206				207				208				209			
Daily feed intake/kg	2.004	2.045	2.087	2.132	2.314	2.361	2.41	2.461	2.581	2.634	2.689	2.746	2.805	2.862	2.922	2.984
Daily weight gain/kg	0.946				0.990				0.992				0.960			
Net energy/Kcal	2500	2450	2400	2350	2500	2450	2400	2350	2500	2450	2400	2350	2500	2450	2400	2350
	add soybean oil and isoleucine				add isoleucine											
FCR	2.12	2.16	2.21	2.25	2.34	2.38	2.43	2.49	2.60	2.66	2.71	2.77	2.92	2.98	3.04	3.11
Feed-to-meat	6.64	6.66	6.70	6.74	7.54	7.56	7.60	7.64	8.23	8.29	8.34	8.41	8.85	8.89	8.94	9.00

The higher the net energy level of the diet, the higher the unit price of the feed, but the lower the cost of the feed for meat production-the net energy level of 206-209 was set at 2450 kcal/kg.

Emission Reduction Effect



Pig farms with obvious decrease in FCR were selected, and the total amount of manure per month in full production pig barns was collected, as shown in the left figure.

1. Manure production peaked in May (wheat formula, high fiber content);

2. In June, the energy was increased by 50 Kcal, and in August, it was increased to 100 Kcal;

3. From June to August, the manure production decreased month by month, from the peak to August, the decrease was about 20%. With the implementation of the new standard, the manure production will continue to decline.

Iteration of precise raw material value evaluation model

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01 First edition

202109—202203

The value assessment at this stage is extensive, and the value of raw materials is assessed by the unit price of protein and energy of corn and soybean meal.

Weak points: Lack of consideration of amino acid levels

02 Second Edition

202203—202305

At this stage, the value assessment of precision raw materials is based on the net energy/amino acids of raw materials and other factors to assess the actual value of raw materials.

Weak points: The formula model is single, and there is still a certain gap with the specific formula usage scenario.

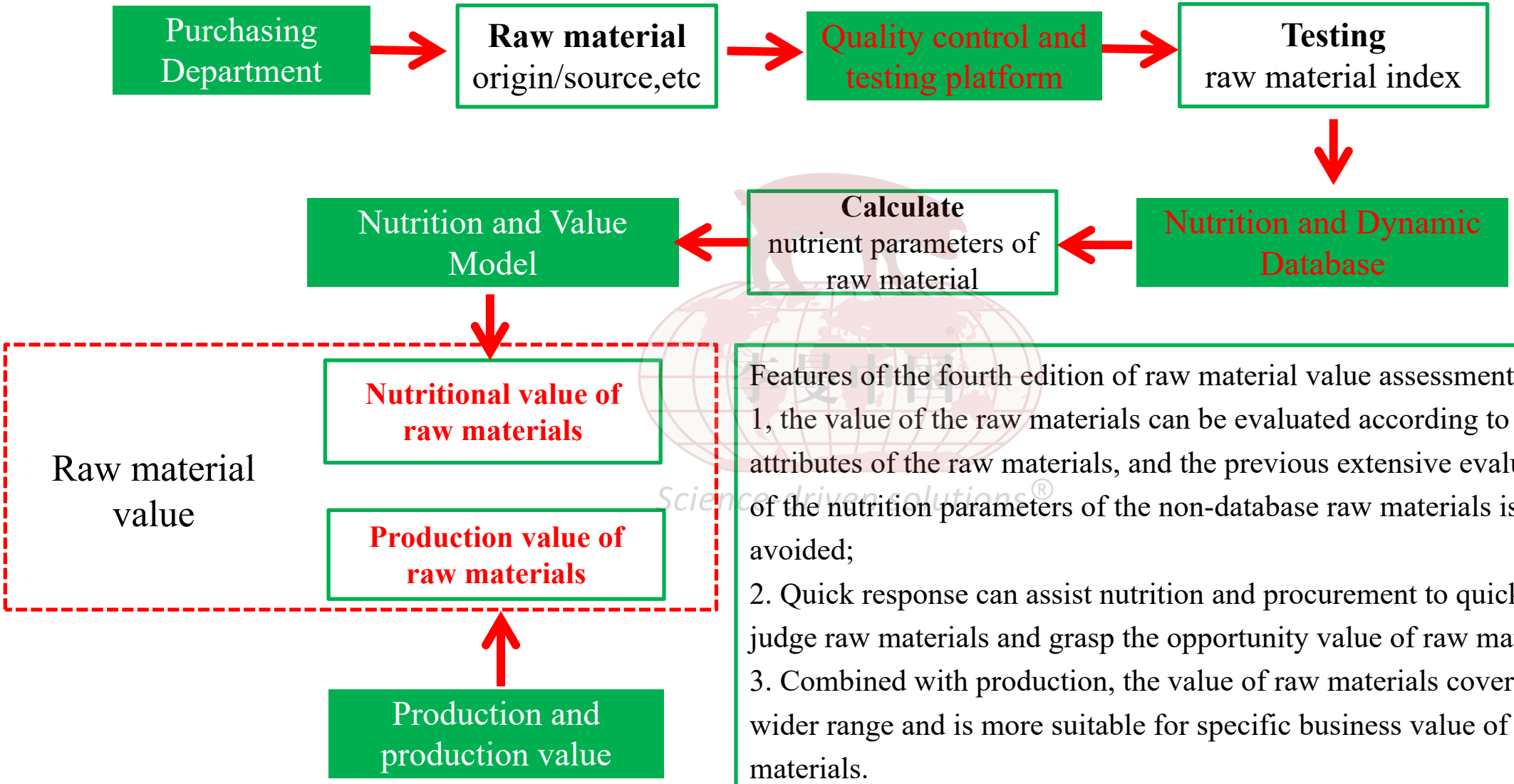
03 Third Edition

202206—202306

In this stage, the raw material value model is based on the specific formula of Brill to calculate the value, and at the same time, corn, soybean meal/bran and amino acids are selected as the calibration.

Weak points: There is no accurate dynamic database in the database, so it is impossible to evaluate the value of raw materials with large differences.

Precision Raw Material Value Model-Fourth Edition



Features of the fourth edition of raw material value assessment model:
1, the value of the raw materials can be evaluated according to the attributes of the raw materials, and the previous extensive evaluation of the nutrition parameters of the non-database raw materials is avoided;
2. Quick response can assist nutrition and procurement to quickly judge raw materials and grasp the opportunity value of raw materials;
3. Combined with production, the value of raw materials covers a wider range and is more suitable for specific business value of raw materials.

Technology and procurement linkage create value (industry benchmark level)

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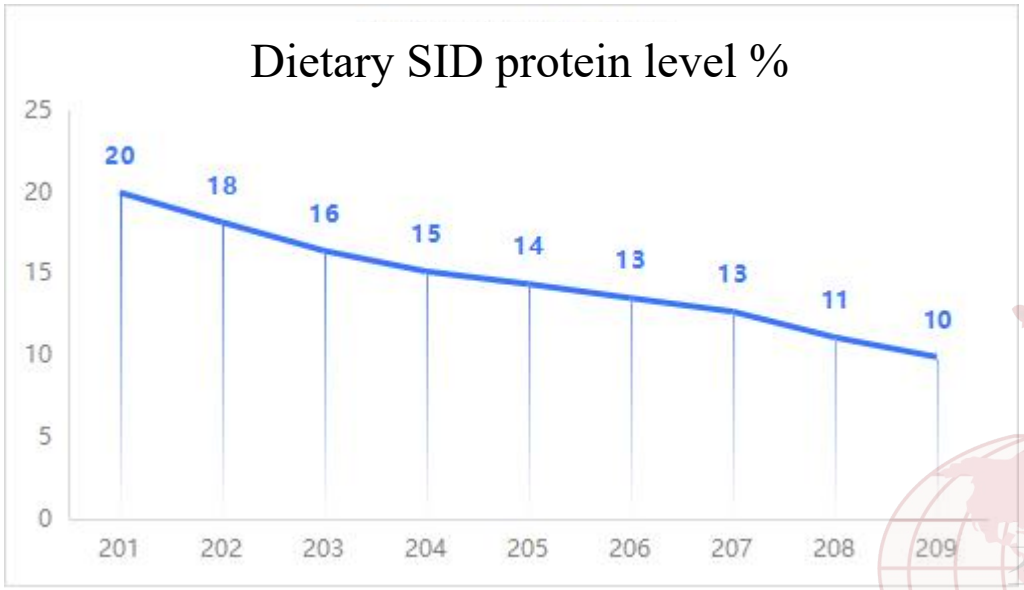

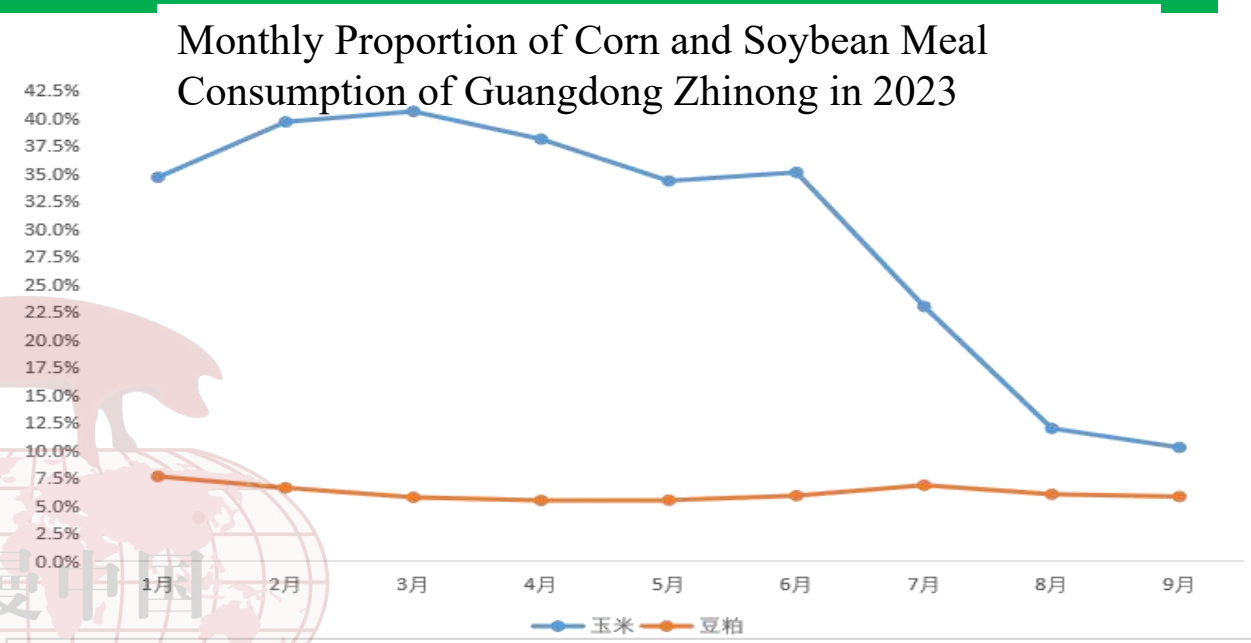

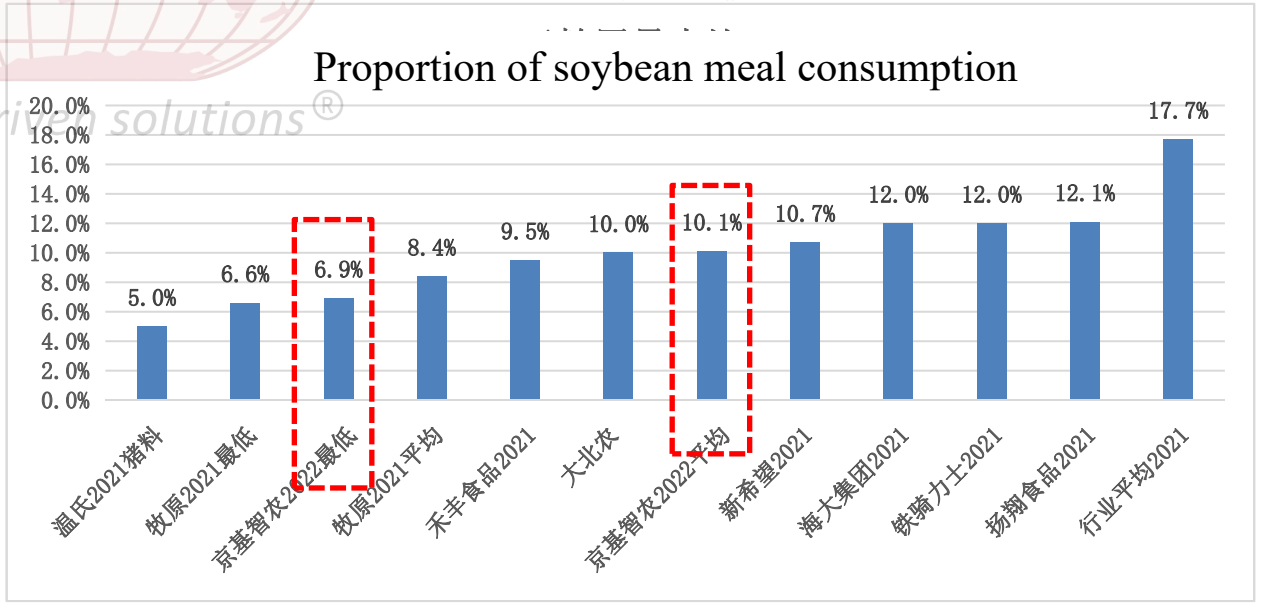

The linkage mechanism of technology, procurement and production has become a powerful tool to cope with market changes - the most economical nutrition supply.

Precision nutrition and feeding density

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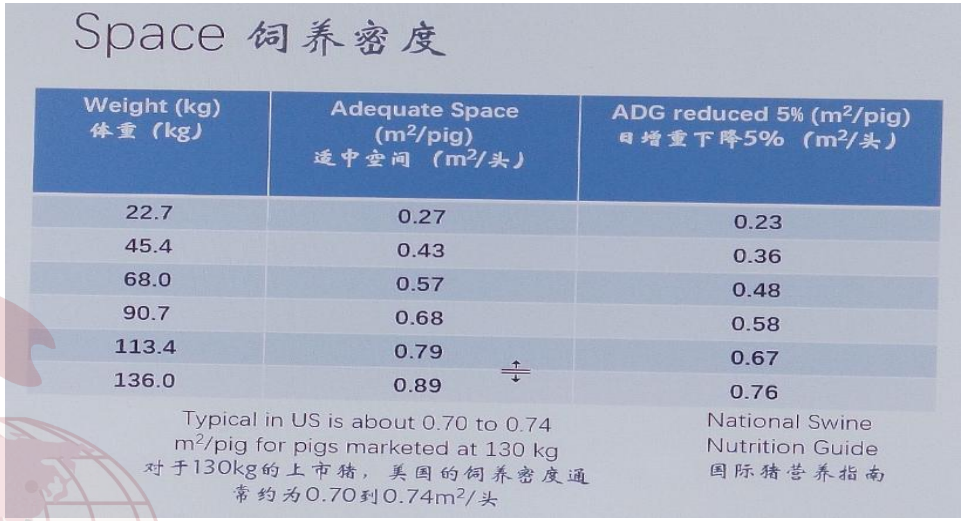
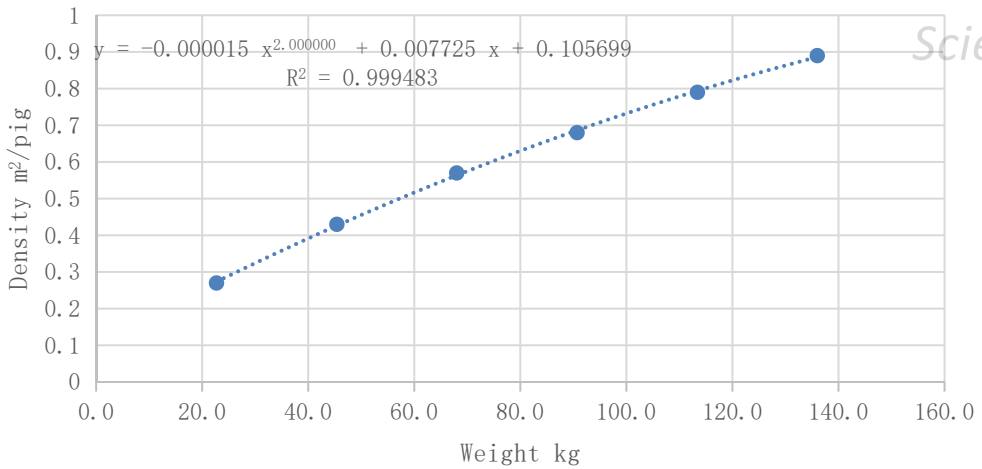
Statistics of Gao Zhou Farm PIC154 Age and weight

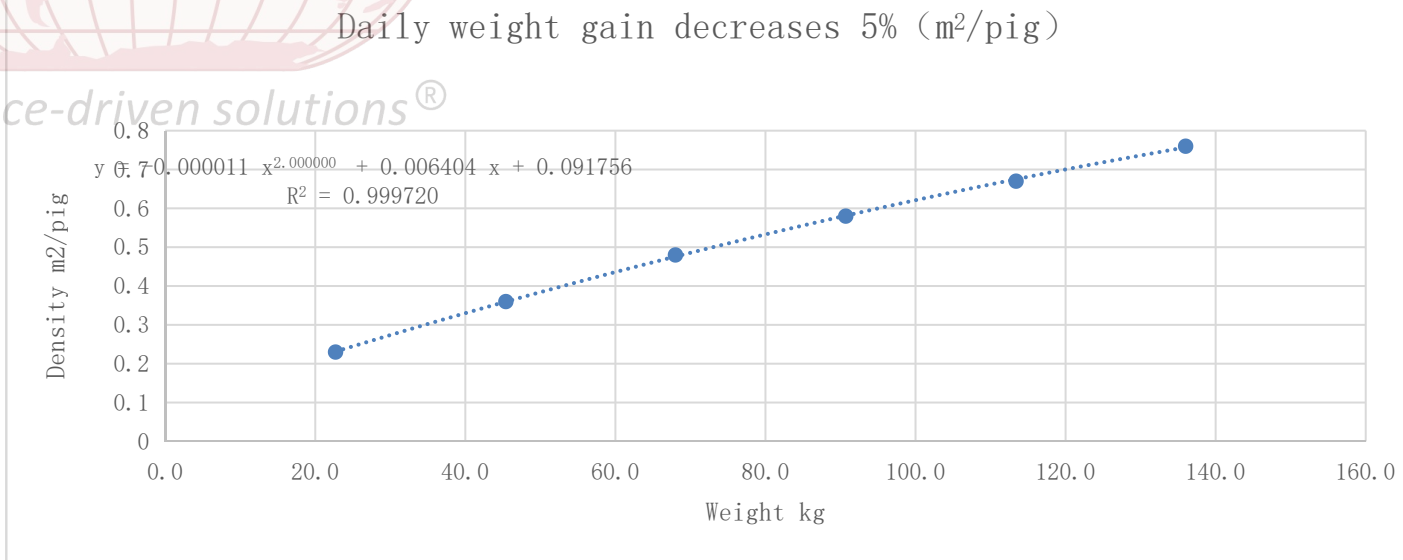
Position	Pen	Breeding stock	Weigh more than 115	Proportion	Initial weight	Final weight	Cumulative feed intake	Days of feed intake	Weight gain	Daily feed intake	Daily wiehgt gain	FCR
fans	A2	20	11	55.00%	6.8	123.0	242.87	134	116.16	1812	867	2.10
	A3	20	3	15.00%	6.7	122.8	242.87	134	116.13	1812	867	2.09
	B2	20	5	25.00%	6.9	121.1	239.89	133	114.20	1804	859	2.10
	B3	20	6	30.00%	6.8	123.4	239.89	133	116.65	1804	877	2.06
	C2	20	6	30.00%	6.6	120.4	229.66	132	113.78	1740	862	2.02
	C3	20	8	40.00%	6.6	120.2	226.89	132	113.62	1719	861	2.00
Middle	A10	20	7	35.00%	6.7	120.7	234.88	134	114.03	1753	851	2.06
	A11	20	4	20.00%	6.7	118.0	234.88	134	111.31	1753	831	2.11
	B10	20	4	20.00%	6.4	118.0	233.58	133	111.58	1756	839	2.10
	B11	20	4	20.00%	6.5	124.3	233.58	133	117.78	1756	886	1.99
	C10	20	4	20.00%	6.5	121.6	225.61	132	115.12	1709	872	1.97
	C11	20	2	10.00%	7.0	124.3	225.61	132	117.26	1709	888	1.93
Cooling pad	A20	20	8	40.00%	6.9	121.9	239.62	134	115.03	1788	858	2.09
	A21	20	7	35.00%	6.3	120.4	239.62	134	114.12	1788	852	2.10
	B20	20	7	35.00%	6.9	121.6	246.69	133	114.68	1855	862	2.16
	B21	20	14	70.00%	6.7	120.6	246.69	133	113.90	1855	856	2.17
	C20	20	7	35.00%	6.6	119.8	235.97	132	113.17	1788	857	2.09
	C21	20	3	15.00%	6.7	117.5	235.97	132	110.81	1788	839	2.13
Total		360	110	30.56%								

Impact of stocking density

Weight，kg	Appropriate space（m²/pig）	Daily weight gain decreases 5%（m²/pig）
22.7	0.27	0.23
45.4	0.43	0.36
68.0	0.57	0.48
90.7	0.68	0.58
113.4	0.79	0.67
136.0	0.89	0.76







Necessity of selling pigs in batches

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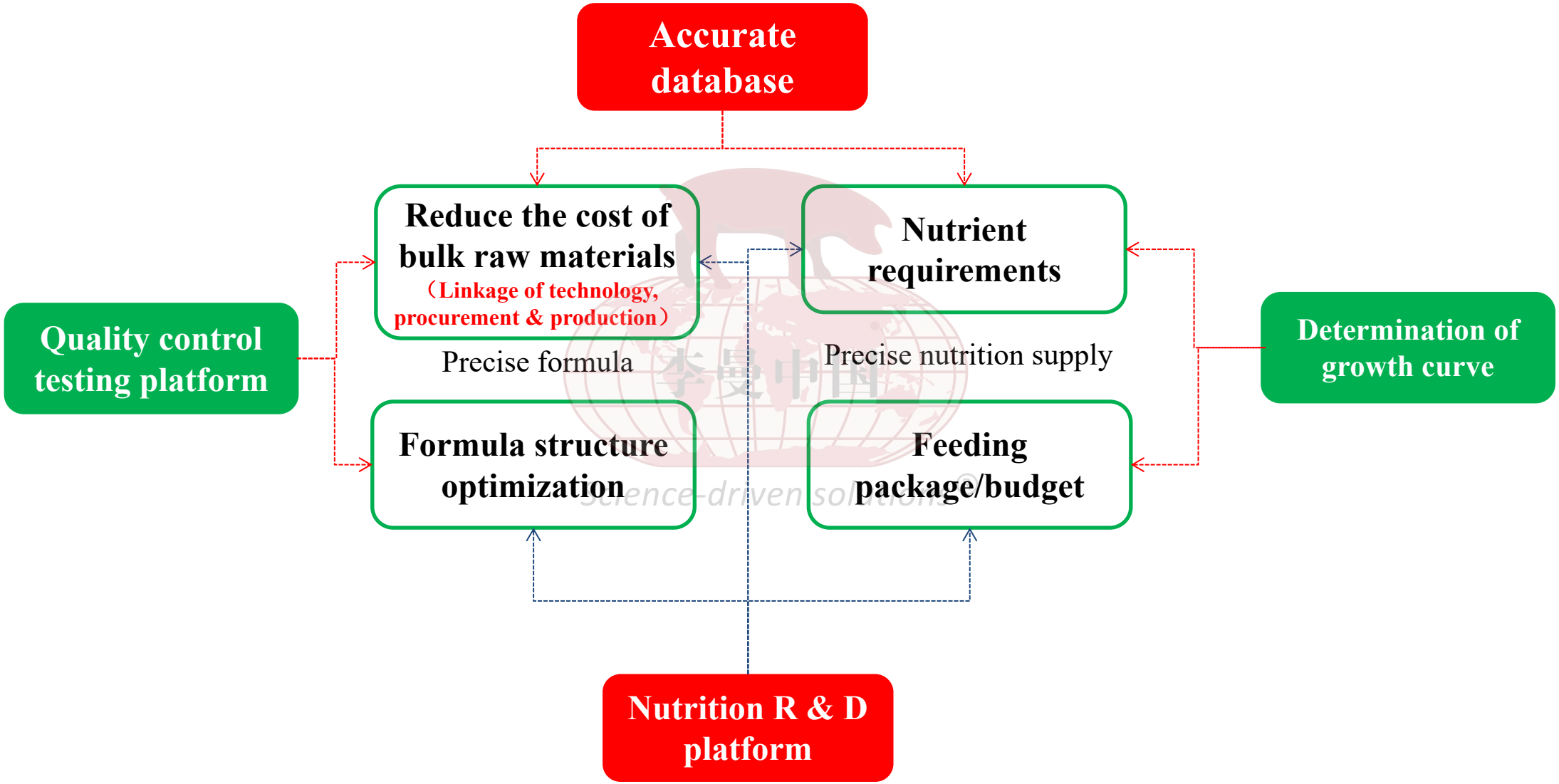
Weight gain was limited by stocking density when 12000-13000 batches were raised to 115 kg

Weight, kg	Appropriate space（m^2/pig）	Number of pigs raised in appropriate density (based on 16.2m^2/pen）	12000 batches, number of pigs/pen (based on 63 pens）	13000 batches, number of pigs/pen (based on 63 pens）	Daily weight gain decreased 5%（m^2/pig）	Number of pigs with a 5% decrease in daily gain (based on 16.2m^2/pen）
23	0.28	59	48	52	0.23	69
33	0.34	47			0.29	56
45	0.42	38			0.36	45
60	0.52	31			0.44	37
75	0.60	27			0.51	32
90	0.68	24			0.58	28
100	0.73	22	24	26	0.62	26
115	0.80	20			0.68	24
120	0.82	20			0.70	23
125	0.84	19			0.72	22
135	0.88	19			0.76	21
140	0.89	18			0.77	21

The Gonyou et al. (2006) study provided a stocking density parameter (appropriate density = 0.0336 * BW ^ 0.667) and found that for every 1% decrease in stocking density, feed intake decreased by 0.252%.

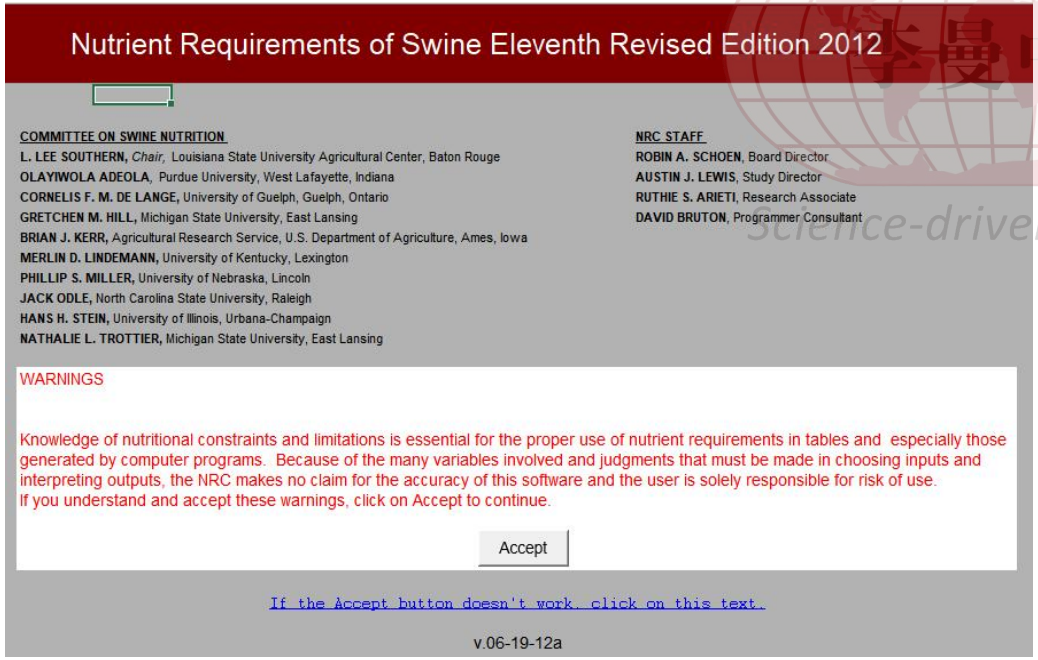
3
Planning of precision nutrition system

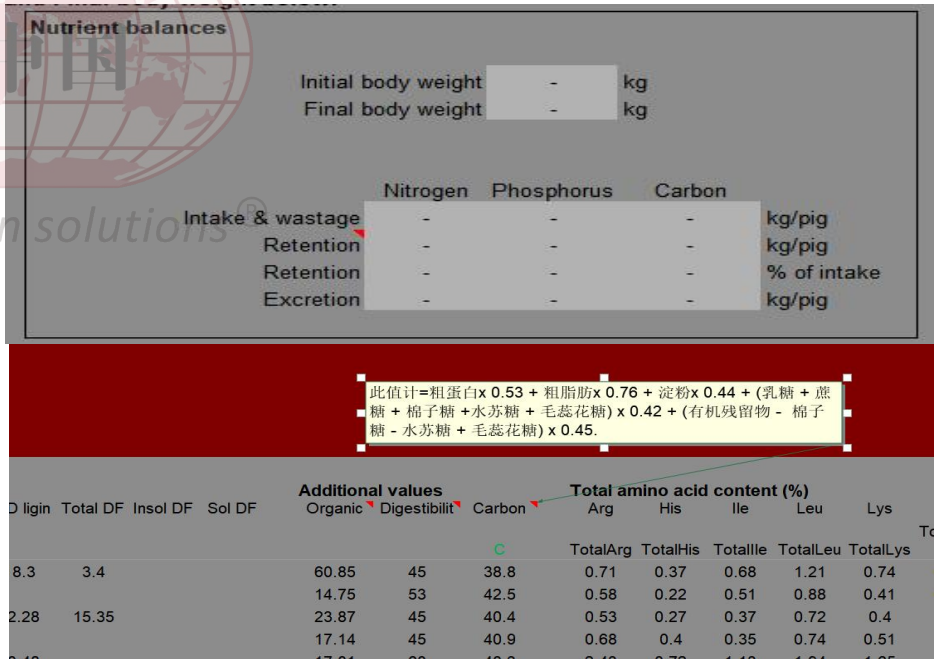
Planning of Precision Nutrition System



Subsequent nutrition work

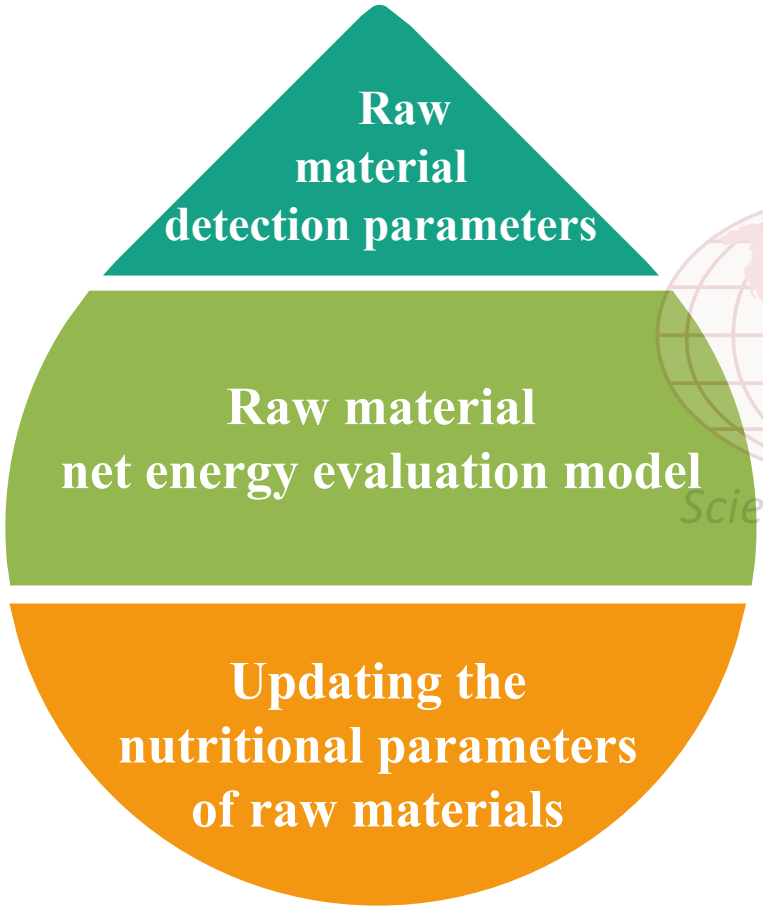
- Accurate nutrition determination: carry it out on a regular basis and establish 6750 model standard; carry out accurate nutrition determination of breeding pigs successively;
- Establishment of dynamic evaluation system for precision raw material database;
- Precise supply: According to the precise nutrition needs, the precise implementation of the feed budget needs to rely on more intelligent equipment to reduce waste;
- Establishment of source emission reduction technology system: emission reduction technology of dietary carbon, nitrogen and phosphorus





Update of Kingkey Raw Material Nutrition Database 4.0

At present, the Kingkey database is in urgent need of improving the perfection of the database under the current situation of complicated use of raw materials. According to the communication between experts and peers, the subsequent database is built with reference to CVB.



Raw material detection parameters

Updating the online raw material database model by updating the key detection parameters of the raw material and outputting the nutrition parameter data of the raw material

Raw material net energy evaluation model

According to the key indicators of raw materials, the net energy evaluation models of different types of raw materials are classified to evaluate the value of raw materials more accurately.

Updating the nutritional parameters of raw materials

Update the digestibility index of raw materials, dietary fiber parameters, fatty acid parameters and other key indicators, and improve the database

The significance of dynamic database -- precise formula +exploring technology and procurement value

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Table 1 Raw material indexes of rapeseed meal from different sources

Source	China	Canada	UAE	India
moisture	11.2	11.4	7.6	9.6
dry matter	88.8	88.6	92.4	90.4
crude ash%	5.8	5.8	6.4	11.4
crude protein%CP	39.1	39.7	37.9	36.8
crude fat g/kg EE	39.0	65.0	28.0	24.0
crude fibre %CF	11.0	11.2	11.9	8.9
acid detergent fiber % ADF	16.8	21.0	19.6	17.8
neutral detergent fiber % NDF	19.9	23.6	23.2	20.7
corn 3000/soybean meal 4300 value assessment	3617	**3743**	3589	**3440**

1.The value difference of rapeseed meal from different sources is more than 303 yuan. Without accurate dynamic database, it is impossible to quantify the value of raw materials with different indicators;

2、The dynamic database is not only more accurate at the formulation level, but also plays a greater role in the procurement decision-making level. (Imported raw materials in Guangdong are miscellaneous/excessive)

Table 2 Amino acid levels of rapeseed meal from different sources

Source	China	Canada	UAE	India
lysine	2.68	2.55	2.59	2.02
methionine	0.69	0.72	0.68	0.62
cystine	0.56	0.57	0.53	0.52
threonine	1.56	1.53	1.46	1.33
tryptophan	0.4	0.4	0.44	0.42
isoleucine	1.47	1.5	1.41	1.36
arginine	2.37	2.43	2.23	2.43
Phe	1.35	1.44	1.3	1.33
histidine	1.03	1.02	0.96	0.95
leucine	2.52	2.56	2.4	2.29
tyrosine	0.81	0.83	0.78	0.79
valine	1.67	1.63	1.56	1.45
alanine	1.52	1.53	1.45	1.35
aspartic acid	2.48	2.5	2.35	2.17
glutamic acid	5.95	6.19	5.7	5.75
glycine	1.88	1.88	1.77	1.73
proline	1.87	1.9	1.77	1.78
serine	1.38	1.4	1.32	1.22
Total amino acid	31.79	32.18	30.26	29.09

Thanks!

- Thanks to Jiang Zongyong, a researcher of Guangdong Academy of Agricultural Sciences (my tutor) and his team for giving precise nutrition technical guidance!
- Thank the Kingkey Smart Agri platform and all its members for their cooperation in the successful implementation of the 6750 model of accurate nutrition determination!
- Looking forward to sharing more achievements in the future!