



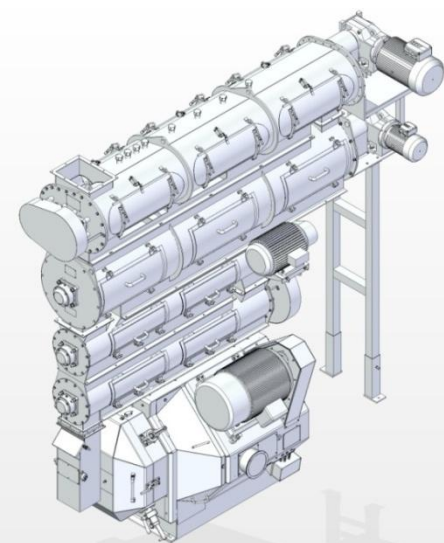
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SHRIMP PELLETING TECHNOLOGY (虾料制粒技术)

MUYANG HOLDINGS CO LTD
2016/5/27

muyang.com



OUTLINE

① MUYANG CO INTRODUCTION

② GENERAL FLOW PROCESS FOR SHRIMP PELLET

③ KEY POINTS FOR SHRIMP PELLETING PROCESS

④ MUYANG 2ND GENERATION SHRIMP PELLET

⑤ FUTURE TREND FOR SHRIMP FEED

MUYANG HISTORY



1967

Hanjiang Grain Machinery Works



1996

Jiangsu Muyang Group Co., Ltd.



2003

Muyang 1st Industrial Park



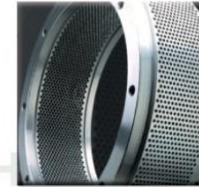
2013

Muyang Sci-tech Industrial Park





Feed Milling: animal feed / aqua feed



premix processing machines and plants

/ pet food /

Grain Storage: steel silo, conveying system, drying system



We help Feed the future



Animal Farming: animal houses, feeding systems, farm environmental systems



Farm-to-table industry chain

Food Processing: oil & fat processing, grain milling



Integrated solutions and services



Others: biomass equipment, steel structure building, plant automation, robotic machines, spare parts



Muyang Sci-tech Industrial Park

Aspiring to be the most advanced production base for feed machinery



Business partner



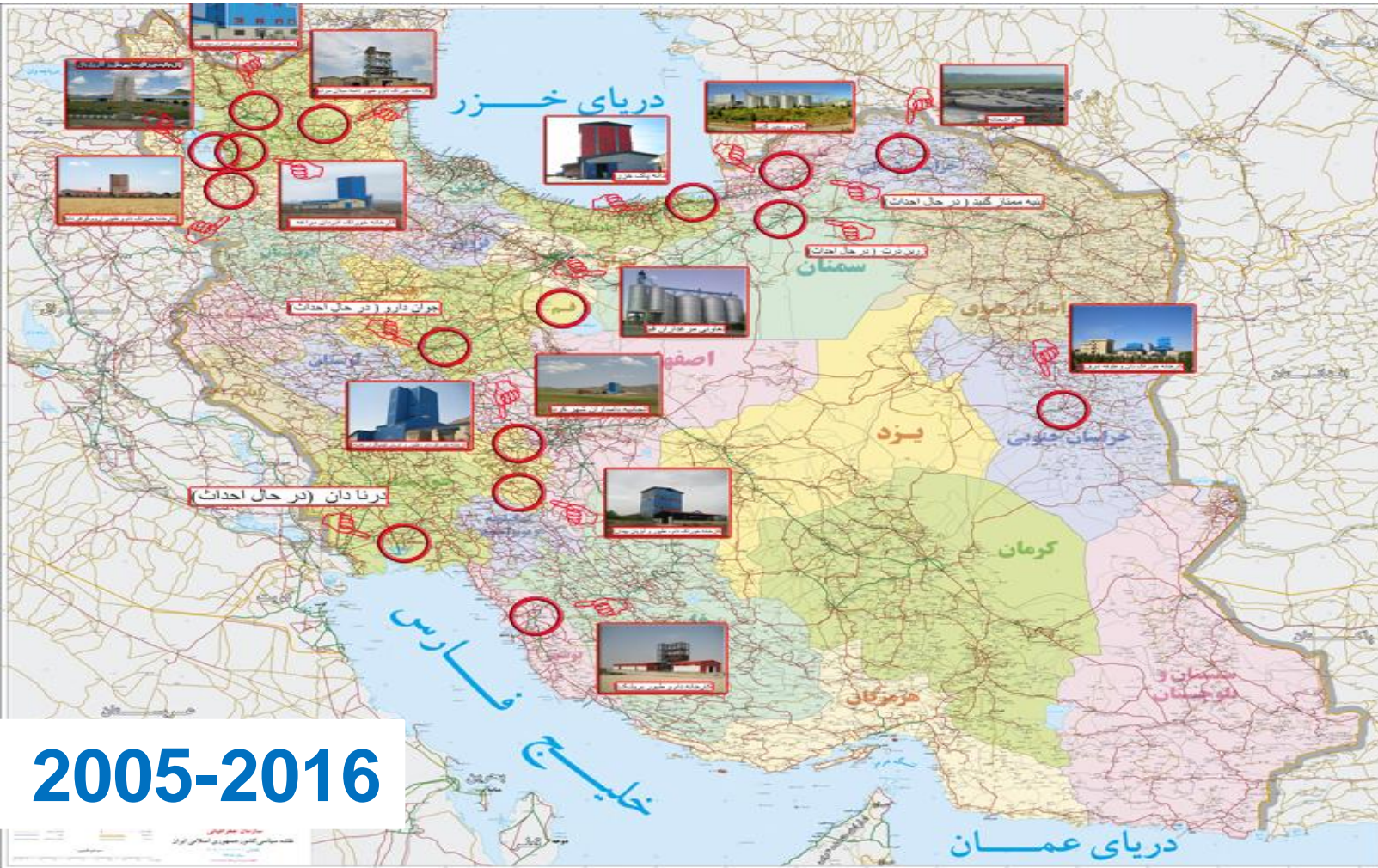
Meet leading manufacturers' requirements

Become strategic partners of **8** of world's top 10 feed manufacturers and **China's** top 30 feed producers



SAN MIGUEL CORPORATION

STRATEGIC PARTNERS AND PROJECTS IN IRAN



- ✧ 22+ Finished Turnkey Projects
- ✧ 11+ Finished Steel Silo Projects
- ✧ 3 Projects Under Process

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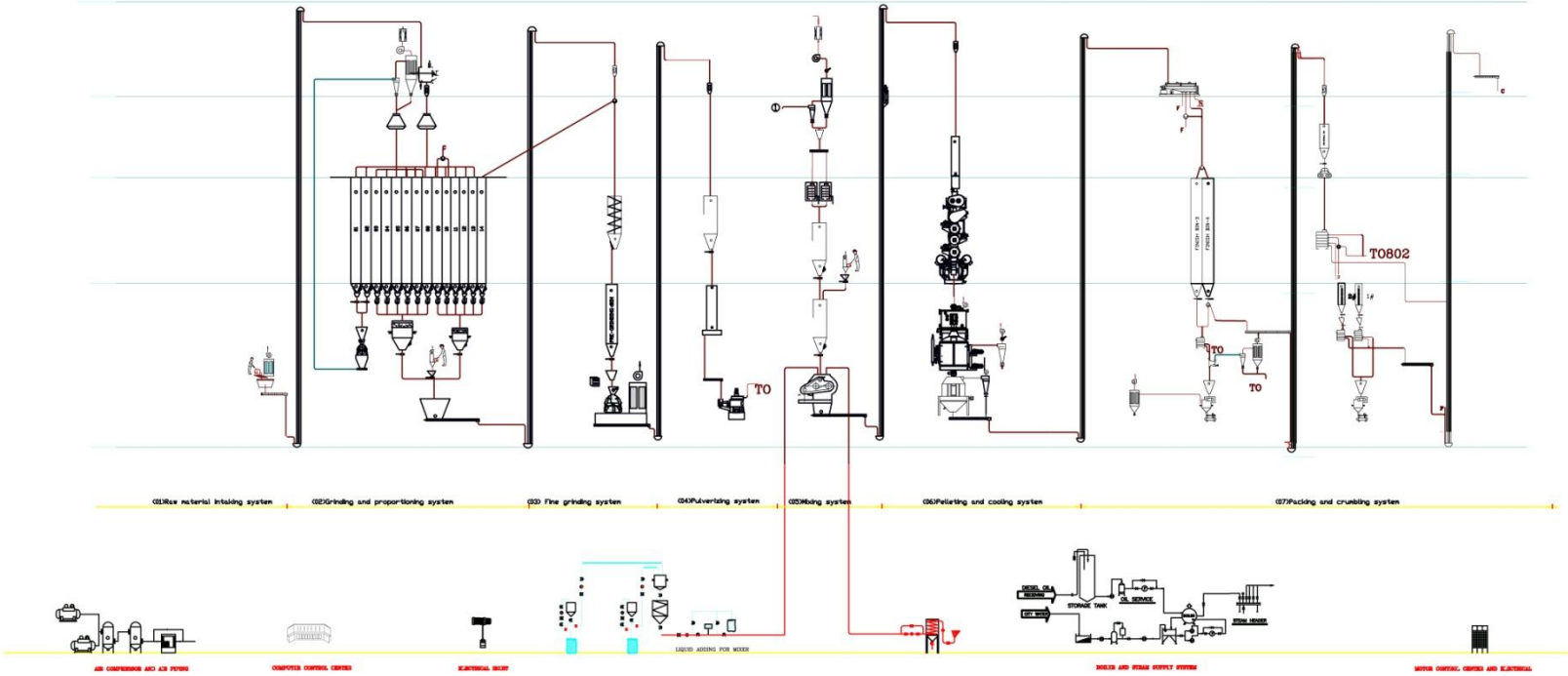
③ KEY POINTS FOR SHRIMP PELLETING PROCESS

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Shrimp Feed Flow Process

HIGH QUALATY SHRIMP FEED PELLETING LINE



Copyright Claim The copyright of this drawing belongs to JIANGSU MUYANG GROUP. All rights reserved.		CLIENT JIANGSU MUYANG GROUP
Design: _____ Check: _____ Date: _____	Design: _____ Check: _____ Date: _____	PROJECT HIGH QUALITY SHRIMP FEED PELLETING LINE
FLOW DRAWING		

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The current situation of Shrimp feed 虾料的现状

- **The current shrimp feed sales fierce competition, in addition to the formula nutritional requirements, appearance of the pellet is also more and more important.** (当前虾料销售竞争激烈，除了配方营养要求外，虾农对虾饲料颗粒的外观品质的要求也越来越苛刻。)

The main defects existing in pellet:(存在的颗粒缺陷主要是)

- **Disuniform cut end and Disuniform pellet length**颗粒长短不一、切口不平整；
- **Poor water stability and Surface crack**耐水性差、表面粗糙裂纹多；
- **Disuniform color**色泽不均一；
- **High percentage fine**含粉率高



Mistaken ideas for improving quality of pelletized shrimp feed

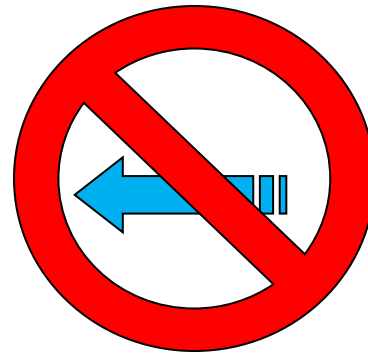
提升虾饲料颗粒品质的误区

Increase water stability
提升耐水性

Reduce fine percentage
降低含粉率

Obtain clean cut ends
提高切口平整性

Obtain uniform pellet length
提高长度均匀性



Reduced output and adding cost
降低了生产效率，增加了生产成本



Increase compress ratio of die hole and increase binder

增大压缩比、增加粘结剂

WRONG METHOD

The key to improve the quality 提升品质的关键

提升品质方法



Improve conditioning efficiency and time over 240s of conditioner

---提高调质效果和时间
≥240s以上

时间

Temperature

温度

crude protein content in the Shrimp formula is above 40%, conditioning temperature should be above 96 °C

---虾料配方中粗蛋白含量高达40%以上，调质温度应≥96℃以上；

The good condition of conditioner:

- Saturated steam;
- Stable Pressure, reliable trap;
- Enough Steam, the system of production 6% to 8% calculation (pressure steam 0.2Mpa)

调质的条件

- 饱和蒸汽；
- 压力稳定，疏水可靠；
- 蒸汽量足够，按系统产量的6~8%计算（按减压后0.2Mpa）

Steam

Water

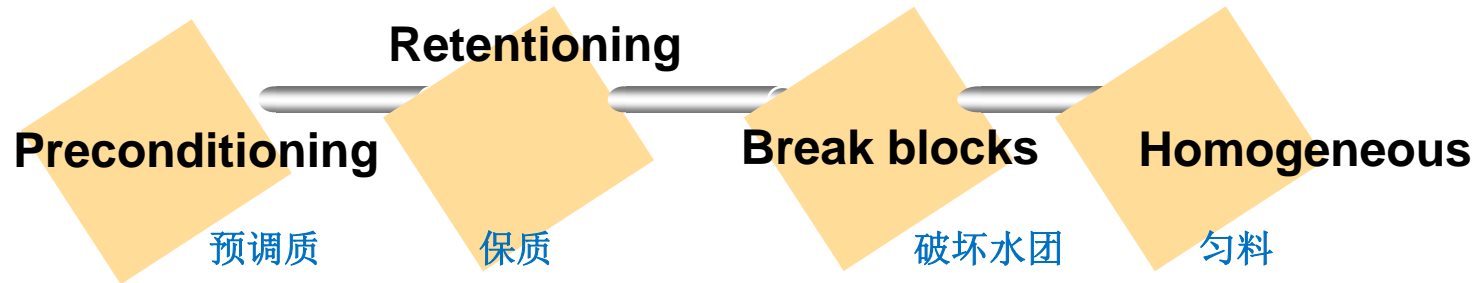
水分

Ensure raw material moisture 12 ~ 13%, after conditioning of water achieve 16 ~ 17.5%;

---在保证原料配方水分12~13%的前提下，调质后的水分达到16~17.5%；

New conditioner for shrimp feed

新虾料调质



Make the material and steam fully mix

使物料与蒸汽充分混合

Long time heat preservation, promote water full penetration, the longest time can reach above 240 s

长时间保温静置，促进水分充分渗透，最长可以达到240s以上

Ruin water drops, make sure uniform quality

击碎水团，保证每一颗虾料品质如一

Adding the time of conditioning, make sure the raw materials get down homogeneous.

增加了调质时间，使下料均匀，减少系统波动

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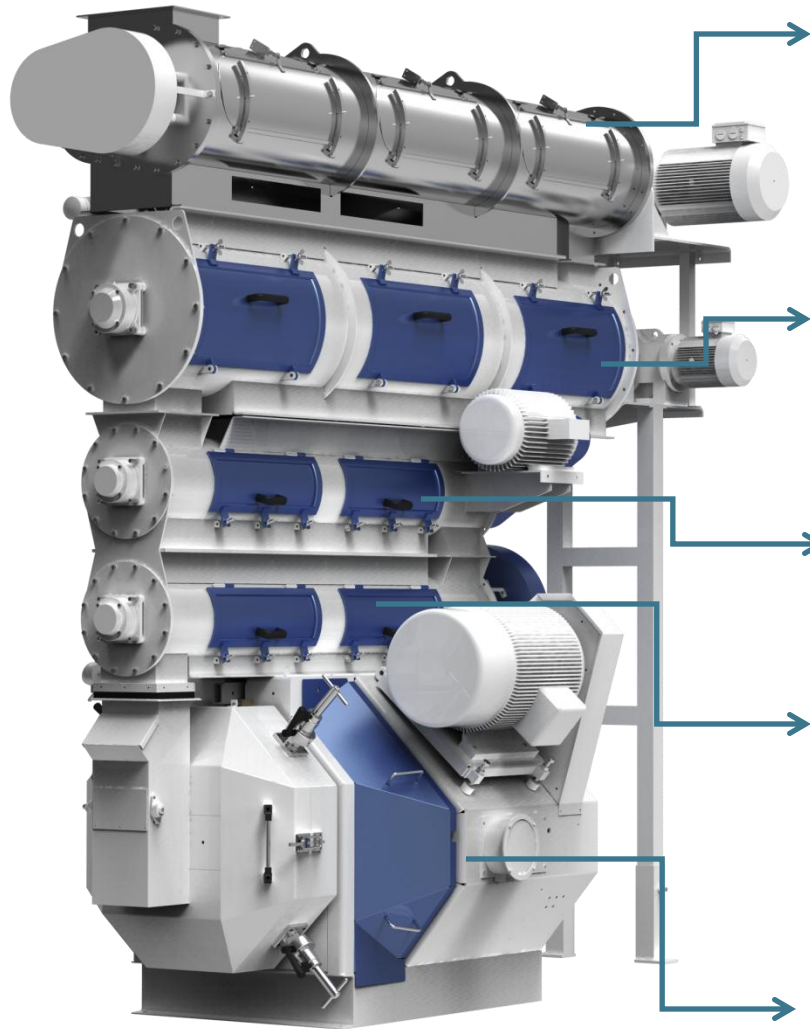
③ KEY POINTS FOR SHRIMP PELLETING PROCESS

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⑤ FUTURE TREND FOR SHRIMP FEED

New shrimp feed pellet mill —SZLH550×170X

新虾料制粒机——SZLH550×170X



Preconditioning, conditioner SBTZ28 is added to 3meter long, full volume up to 60%, the tempering time up to 90 s

预调质器，牧羊加长 SBTZ28至3m，15kW，有效长度约3000mm，充满度可达60%，调质时间可达90s

Keep conditioner, 4kW, Frequency control, cylinder diameter ϕ 600, effective length 3000mm, full volume up to 45%, keeping time above 120s;

保质器，4kW，变频控制，转速5-20转/分，筒体直径 ϕ 600，有效长度3000mm，充满度45%，保持时间长达120s以上；

Break conditioner, 7.5 kW, speed 500 RPM, cylinder diameter 350mm, length is 2150 mm, full volume up to 25 ~ 30%

打碎器，7.5kW，转速500转/分，筒体 ϕ 350，长度2150mm，充满25~30%

Normal Conditioner, 7.5kW, speed 200 RPM, cylinder diameter ϕ 350, length is 2150mm, full volume up to 25~30%

调质器，7.5kW，转速200转/分，筒体 ϕ 350，长度2150mm，充满25~30%

Muyang pellet SZLH550×170X, 2 rolls, 55kW×2 Timing Belt Drive, capacity 3.0~4.0t/h for size ϕ 1.6~1.8 of die

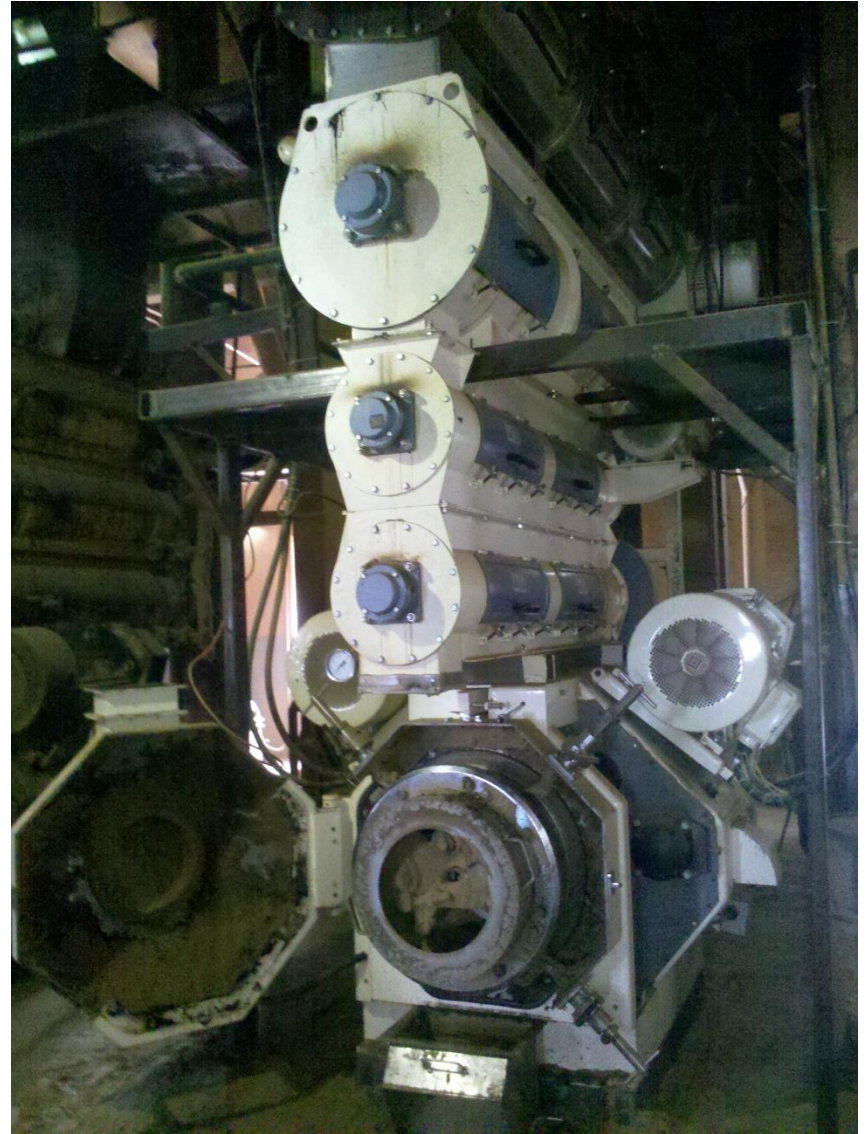
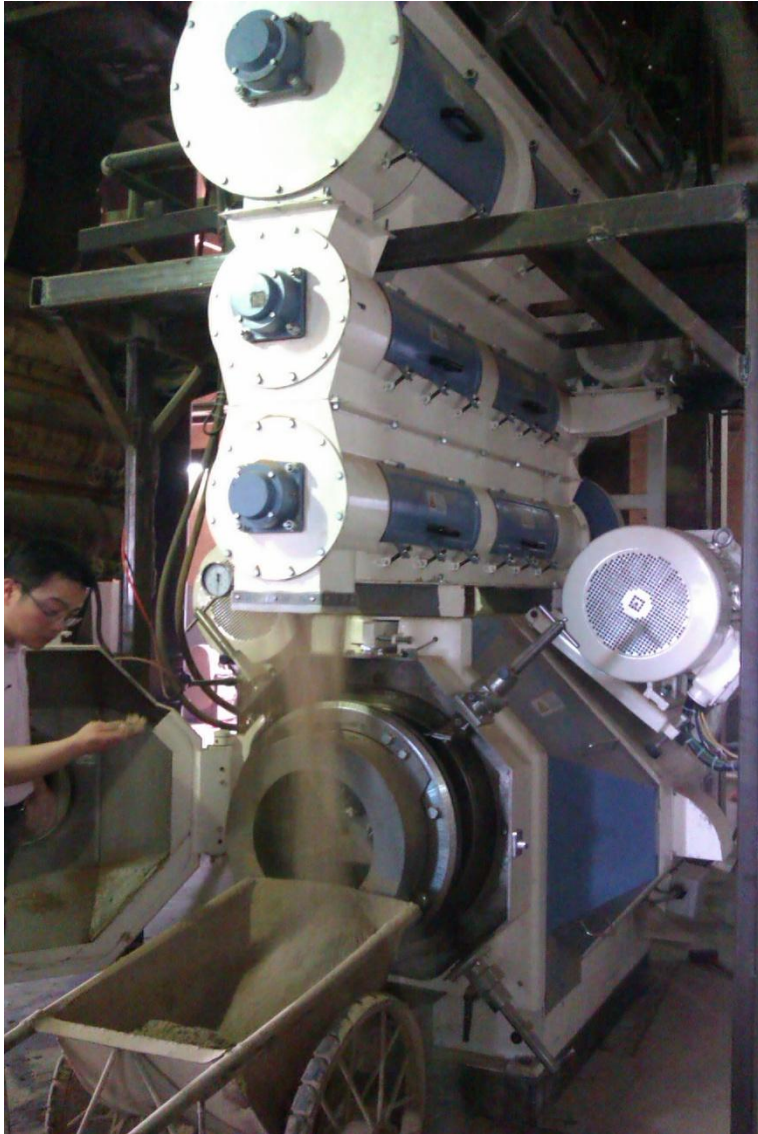
牧羊SZLH550×170X制粒机，2压辊结构，55kW×2，按 ϕ 1.6~1.8颗粒，产量3.0~4.0t/h

Main technical parameters——SZLH550×170X

主要技术参数——SZLH550×170X

Model 型号	SZLH550×170X
Power, kW	55×2
Capacity (Φ1.6~1.8mm)	3.0~4.0t/h
Conditioner power, kW	15+4+7.5×2
Total time for conditioning, s	≥300s
Feeder power, kW	1.5
Size of die: Internal diameter×Effective working width, mm	Φ550×170
Roller diameter, mm	Φ248
Roller number	2
Steam usage, kg/h	≤320kg/h

USING IN SOUTH OF CHINA



The conditioning time is determined

调质时间的测定

Work record 工作记录表

Time 2015.5.11

Conditioner													Capacity	Time of conditioning	Note
NO.	Feeder	DDC (15kw)		Keeping conditioner (4KW)		Single conditioner II(7.5)		Single conditioner I(7.5)		capacity T/H	Time S	Note			
	frequency Hz	Current A	Full volume %	frequency Hz	current A	current A	Full volume %	current A	Full volume %						
1	35	14.4	65	18	1.4	12.5	25	10.5	25	3.57	338				
2	37.5	14.6	70	21	1.6	12.8	30	10.7	28	3.8	300	Pressure of steam 0.25Mpa			

Note: Die Hole Size ϕ 1.8 , compression ratio of die hole 1:25

The actual production data shows that new pellet mill compared to the old one:

实际生产数据证明，新虾料制粒机组与旧机组相比：

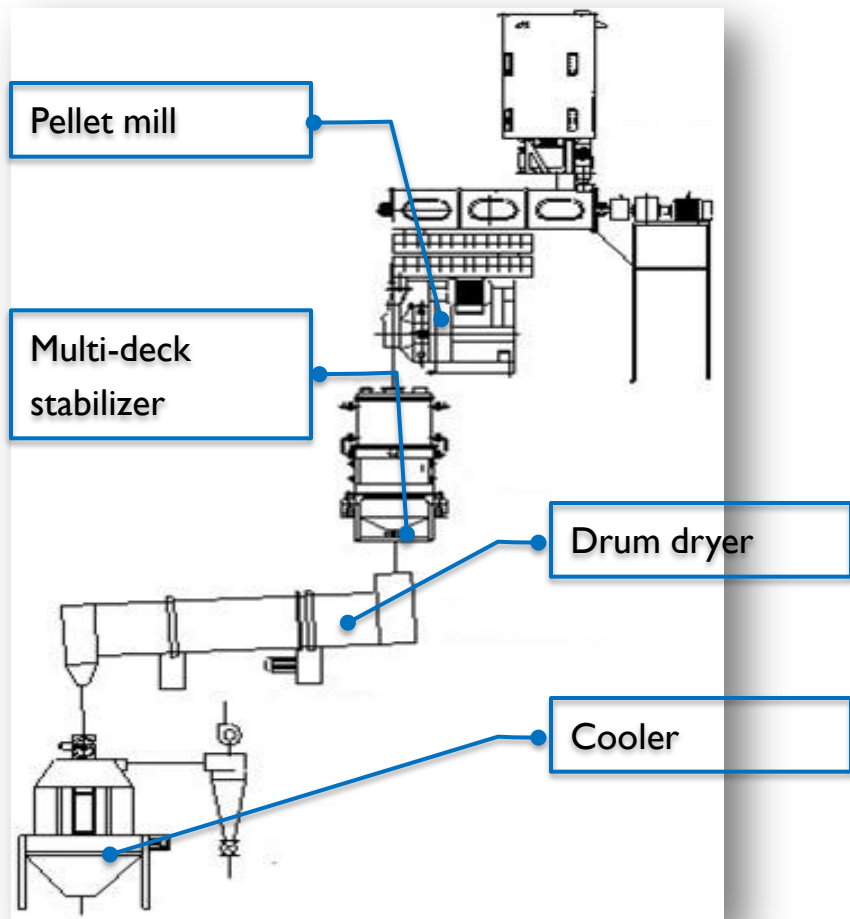
- 1、Conditioning time : from 120~180s change to 300~338s,
- 2、Fine rate: decreased by 30~60%
- 3、Starch gelatinization: improved by 30~51% in average;
- 4、Capacity of pellet mill: 3.5t/h to 4.3t/h;
- 5、Energy saving : 20-30% of power consumption decreased
- 6、Uniform size of feed: improved by 50%

Pellet diameter $\phi 1.8$	Length of pellet > 3.0mm	Length of pellet = 1.5~3.0mm	Length of pellet < 1.5mm
Old pellet mill	40%	35%	25%
Second generation pellet mill	10%	70%	20%

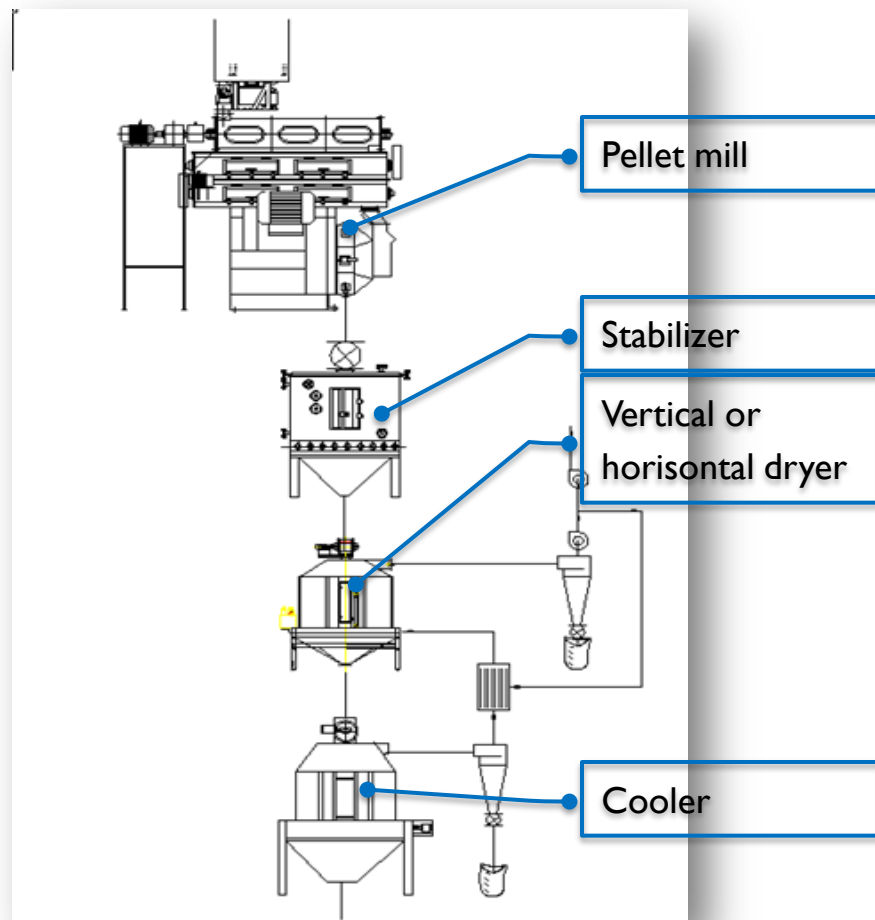
Post conditioning process

制粒机之后的熟化处理设备

Process 1



Process 2



In China, most feed producers prefer process 1

在中国，多数厂家选择工艺I

- **Functions of stabilizer**

稳定器的作用

- **Increase gelatinization level;**
提高糊化度;
- **Reduce fines percentage;**
粉化率降低;
- **Increase water stability.**
延长耐水时间。

Stabilizer



- **Functions of drum dryer**

滚筒烘干机的作用

- **Dewater ;**
降低水分
- **Increase gelatinization level;**
提高糊化度
- **Smooth feed pellet.**
去除虾料颗粒的棱角

Drum dryer



- **Stabilizer**
稳定器
- **Model**设备型号: **SWDB24×24A**
- **Stabilizing time**稳定时间: $\geq 30\text{min}$
(depends on feeding amount)
- **Capacity**产量: 6 ~7 t/h
- **Jacket structure**

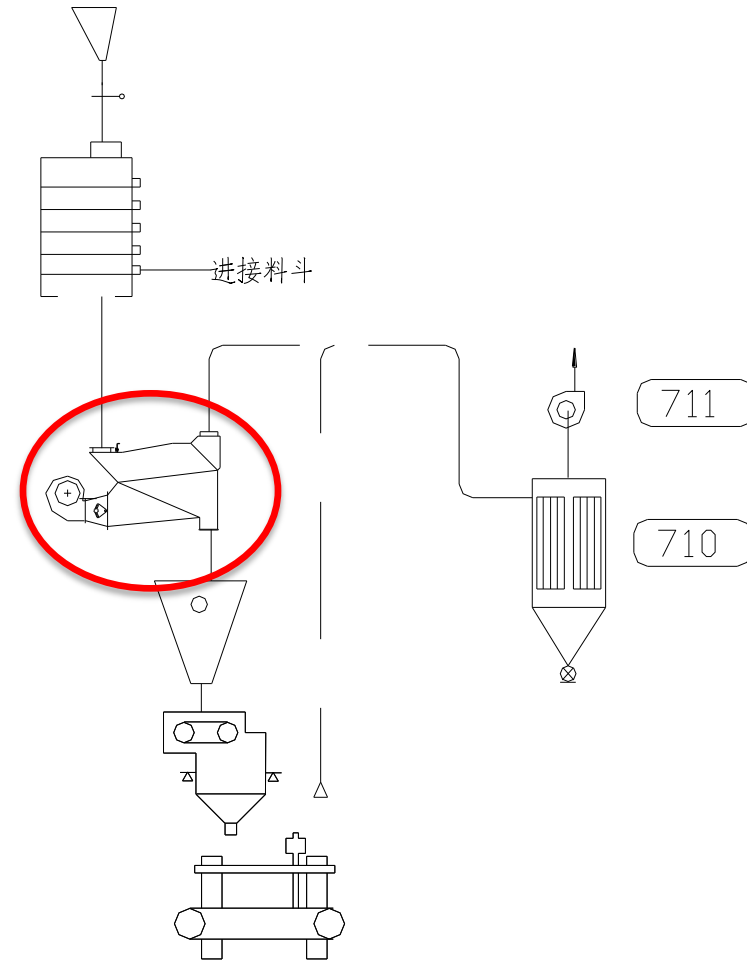


Clean up the fines and brokens in finished product with a winnowing machine

成品筛理：打包前利用风选设备清理粉末和碎料

- **Clean up the fines and brokens generated during pellet transportation, and then bagging.**

打包前清理虾料中因流程运输过程中产生的粉末和碎料。



Test effect contrast of shrimp pellet

虾料试验效果对比



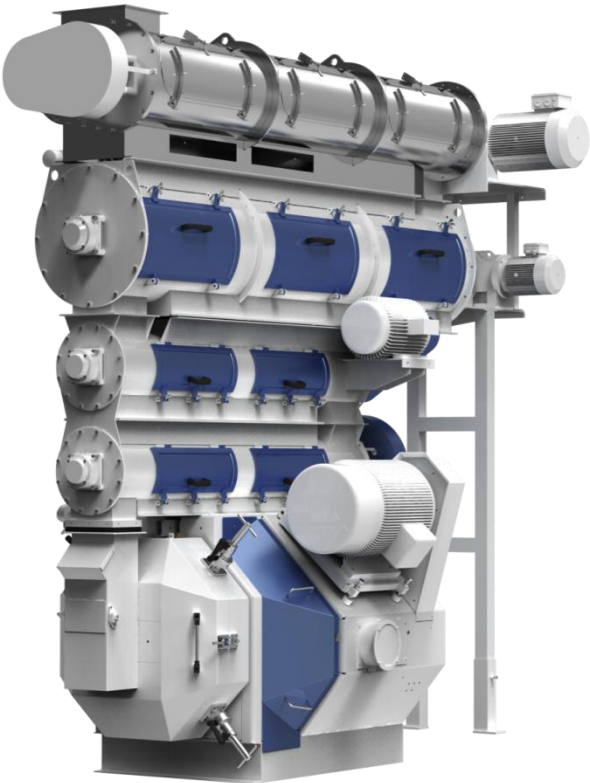
For 24 hours in water
浸泡24小时后



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Pelleting or Extruding?



Pelleting or Extruding?

1-Investment comparison:

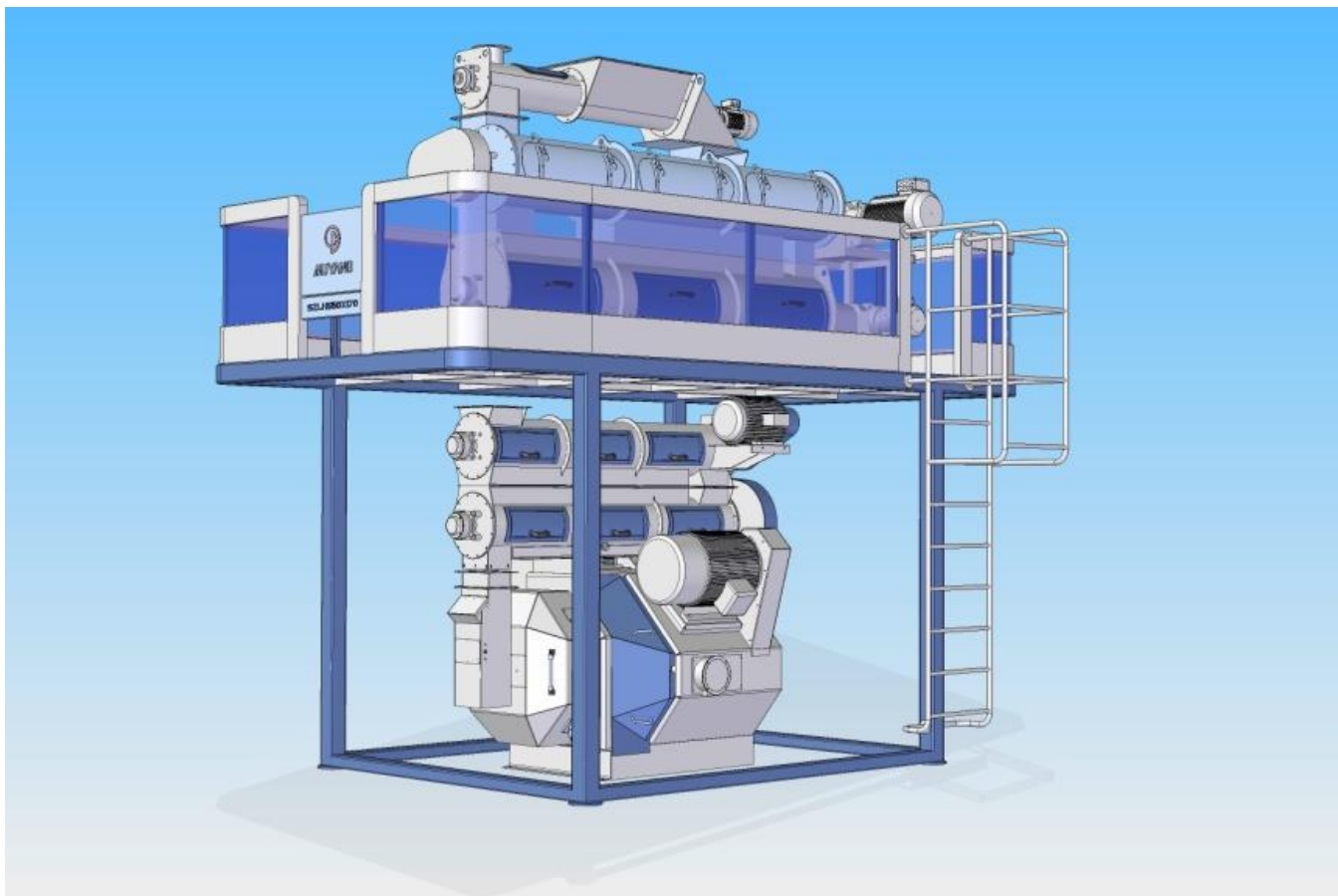
	Pelleting	Extruding
Cost of Equipment	Low	20% higher
Power Consumption	Low	30% higher
Water Consumption	0	\$0.5/ton (china)
Steam Consumption	Low	500% higher
Fomula Cost	Higher	30% Lower

Pelleting or Extruding?

2- Final Product Comparison :

	Pelleting	Extruding
Gelatinizing starch	30%	Up to 90%
Efficiency (FCR)	Lower	10-15% higher
Water Pollution	Higer	Less
Stability in water	Up to 3Hr	Up to 20Hr
Price	Low	10% higher, varies in different area,
Hygiene	Good	Much Better, but by extruding it will damage some heat sensitive fomula, like Vitamin C, some Amino Acid...
Palatabilities	Good	Much Better
Waste of feed	High	Much Lower

让我们共同前进



Let's go ahead together!