09/12 Expert communication

Communication channel	Wechat
Date	09/12
Time	12:00PM-18:00
Attendees	Minghui Zhang John Xu (expert)

Agenda

1. Determine the suitable process for black soldier fly larvae based on the raw material composition.
2. Basic information, including working principle and working parameters toward to key components in the processing.

Notes

1. We need to use batch cooker if we cook and dry the insect instead of continuous cooker.
2. The original work flow is only for fish. The raw material can only be fish. Based on the raw material composition (insect), manufacture suggest us to use the process for meat. There are some difference between the two processes.
    1. Fish processing process can only process the fish. For the poultry rendering process, it can process chicken, pig, feather and animal offal. From the manufacture point of view, he recommend us to process the insect by using the poultry rendering process.
    2. For the poultry rendering process, it cooks the meat and then dry the meat in the batch cooker. For the fish processing process, it cooks the fish in the continue cooker and then use the dryer to dry the fish meat.
    3. The fish meal process can work continuously. Poultry rendering work as batch. Normally, as one batch completed, the other batch will start to work. (After the breaker finish the work, it will go into the batch cooker). The benefits of the poultry rendering process is it is easily to control the pressure and temperature compared with the continue cooker. The other benefits is it can heat the material more evenly.

4. For the poultry rendering process, it uses the single screw fat press. Fish processing process uses the twin screw fat press.

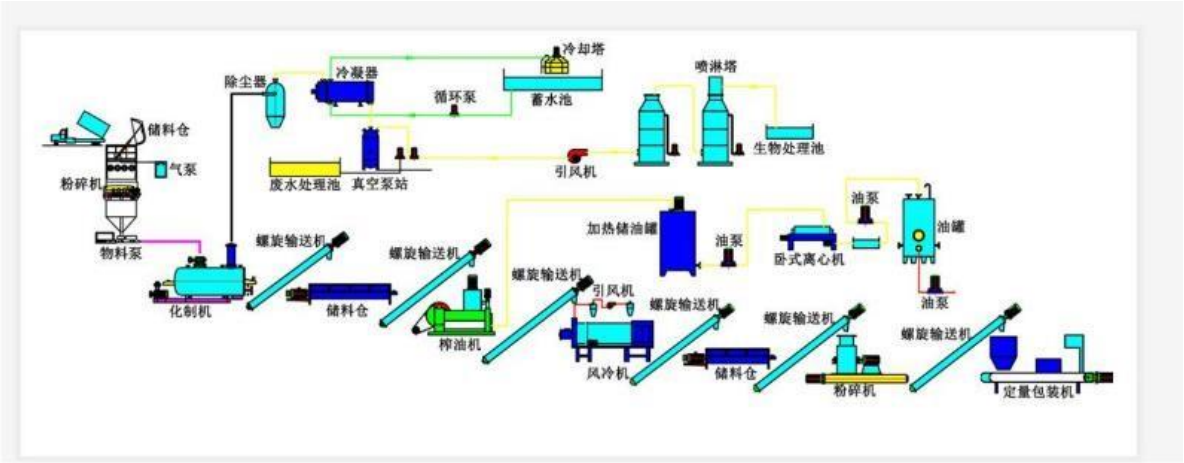


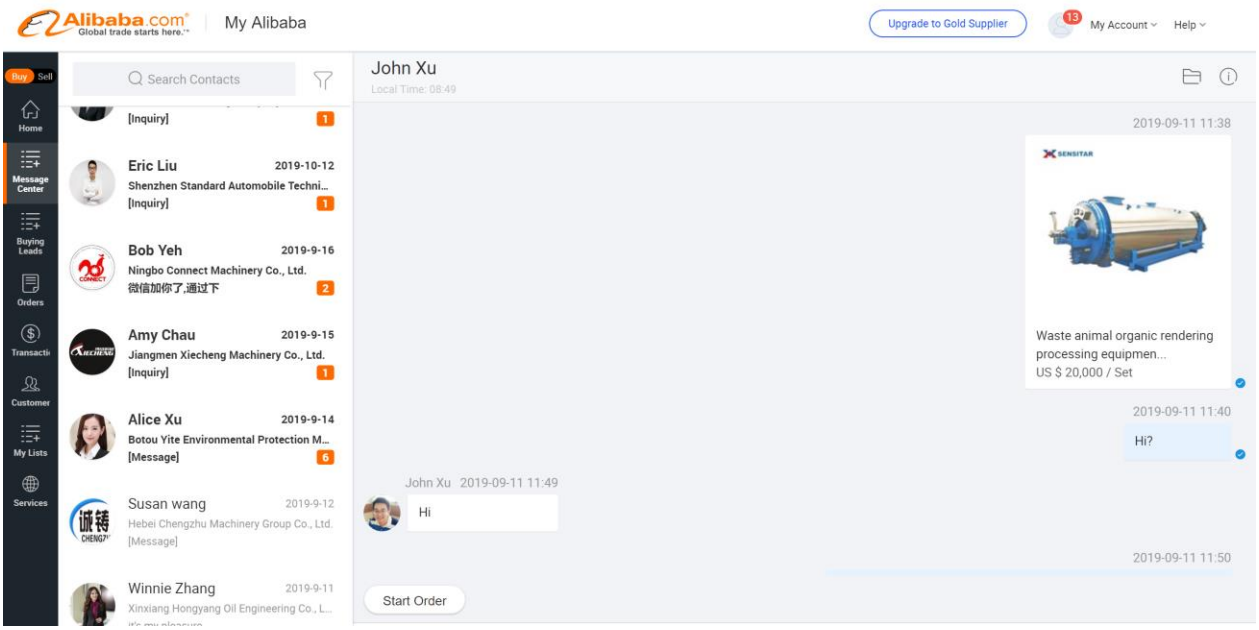
Figure 1: poultry rendering process

3. Batch cooker: cooking temperature is maximum up to 120-140 degree Celsius. Drying temperature is maximum up to 160-180 degree Celsius. The working pressure is 0.6Mpa. The temperature and pressure are adjustable.

Action Items

Action item	**Owner**	**Deadline**
Modify the working process	All team	09/15

Screenshots of communication with experts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Amy Chau 2019-9-15
Jiangmen Xiecheng Machinery Co., Ltd.
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Alice Xu 2019-9-14
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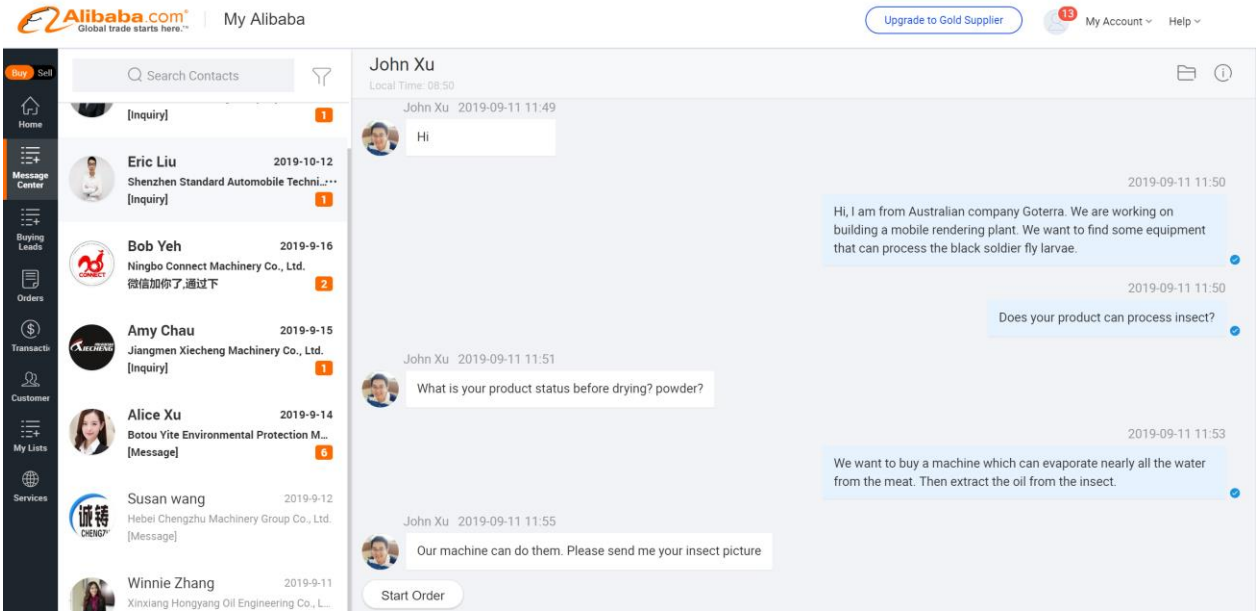
[Message] 6
Susan wang 2019-9-12
Hebei Chengzhu Machinery Group Co., Ltd.
[Message]
Winnie Zhang 2019-9-11
Xinxiang Hongyang Oil Engineering Co., L...
John Xu
Local Time: 08:49
2019-09-11 11:38
SENSITAR
Waste animal organic rendering processing equipmen...
US $ 20,000 / Set
2019-09-11 11:40
Hi?
John Xu 2019-09-11 11:49
Hi
2019-09-11 11:50
Start Order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Global trade starts here.
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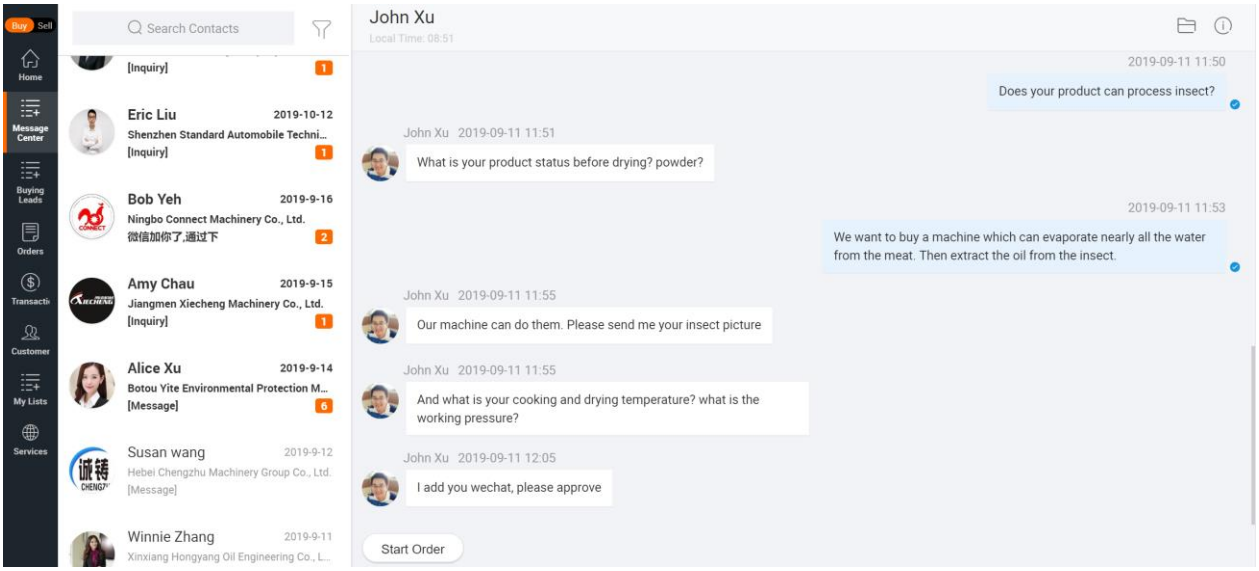
[Message]
Winnie Zhang 2019-9-11
Xinxiang Hongyang Oil Engineering Co., L...
John Xu
Local Time: 08:50
John Xu 2019-09-11 11:49
Hi
2019-09-11 11:50
Hi, I am from Australian company Goterra. We are working on building a mobile rendering plant. We want to find some equipment that can process the black soldier fly larvae.
2019-09-11 11:50
Does your product can process insect?
John Xu 2019-09-11 11:51
What is your product status before drying? powder?
2019-09-11 11:53
We want to buy a machine which can evaporate nearly all the water from the meat. Then extract the oil from the insect.
John Xu 2019-09-11 11:55
Our machine can do them. Please send me your insect picture
Start Order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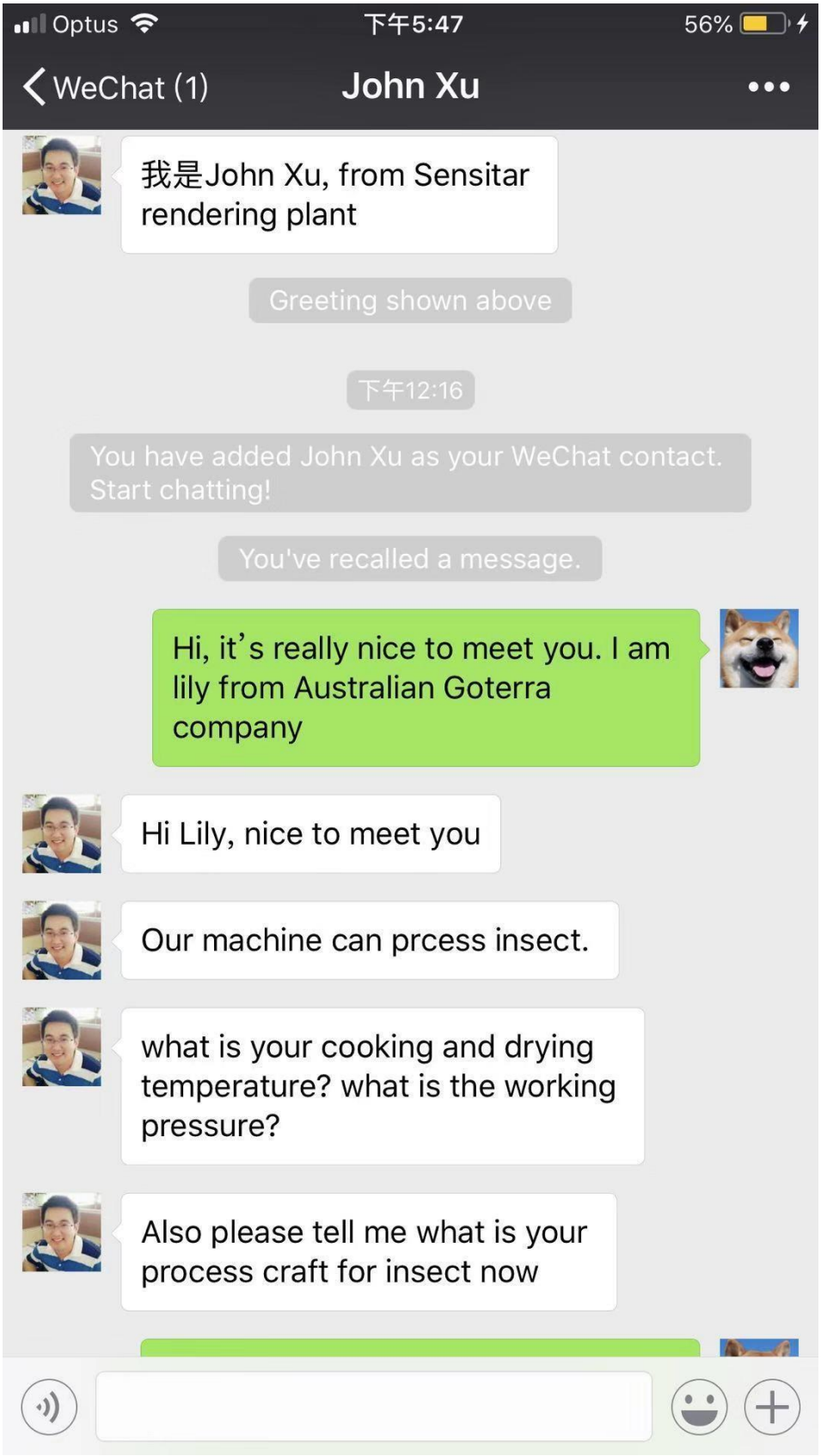
Local Time: 08:51
2019-09-11 11:50
Does your product can process insect?
John Xu 2019-09-11 11:51
What is your product status before drying? powder?
2019-09-11 11:53
We want to buy a machine which can evaporate nearly all the water from the meat. Then extract the oil from the insect.
John Xu 2019-09-11 11:55
Our machine can do them. Please send me your insect picture
John Xu 2019-09-11 11:55
And what is your cooking and drying temperature? what is the working pressure?
John Xu 2019-09-11 12:05
I add you wechat, please approve
Start Order


Optus
下午5:47
56%
WeChat (1)
John Xu
我是John Xu, from Sensitar rendering plant
Greeting shown above
下午12:16
You have added John Xu as your WeChat contact. Start chatting!
You've recalled a message.
Hi, it's really nice to meet you. I am lily from Australian Goterra company
Hi Lily, nice to meet you
Our machine can prcess insect.
what is your cooking and drying temperature? what is the working pressure?
Also please tell me what is your process craft for insect now

Optus 下午5:47 56%

WeChat (1) John Xu

I can briefly introduce our product first. Our project is designing and building the mobile rendering plant. So we want our whole system can fit in one or more modular unit. So they can fit in 40 feet shipping box.

下午12:23

Your material is only insect?

下午12:29

Yes

It's black soldier fly larvae

let me check

Ok that's will be really good. One more question is do you mind

Optus 下午5:47 56%

WeChat (1) John Xu

Ok that's will be really good. One more question is do you mind explain more details what the key function of your product and what's the final product.

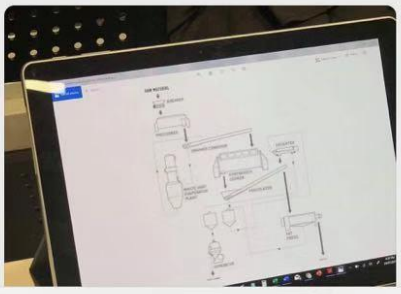
下午12:36

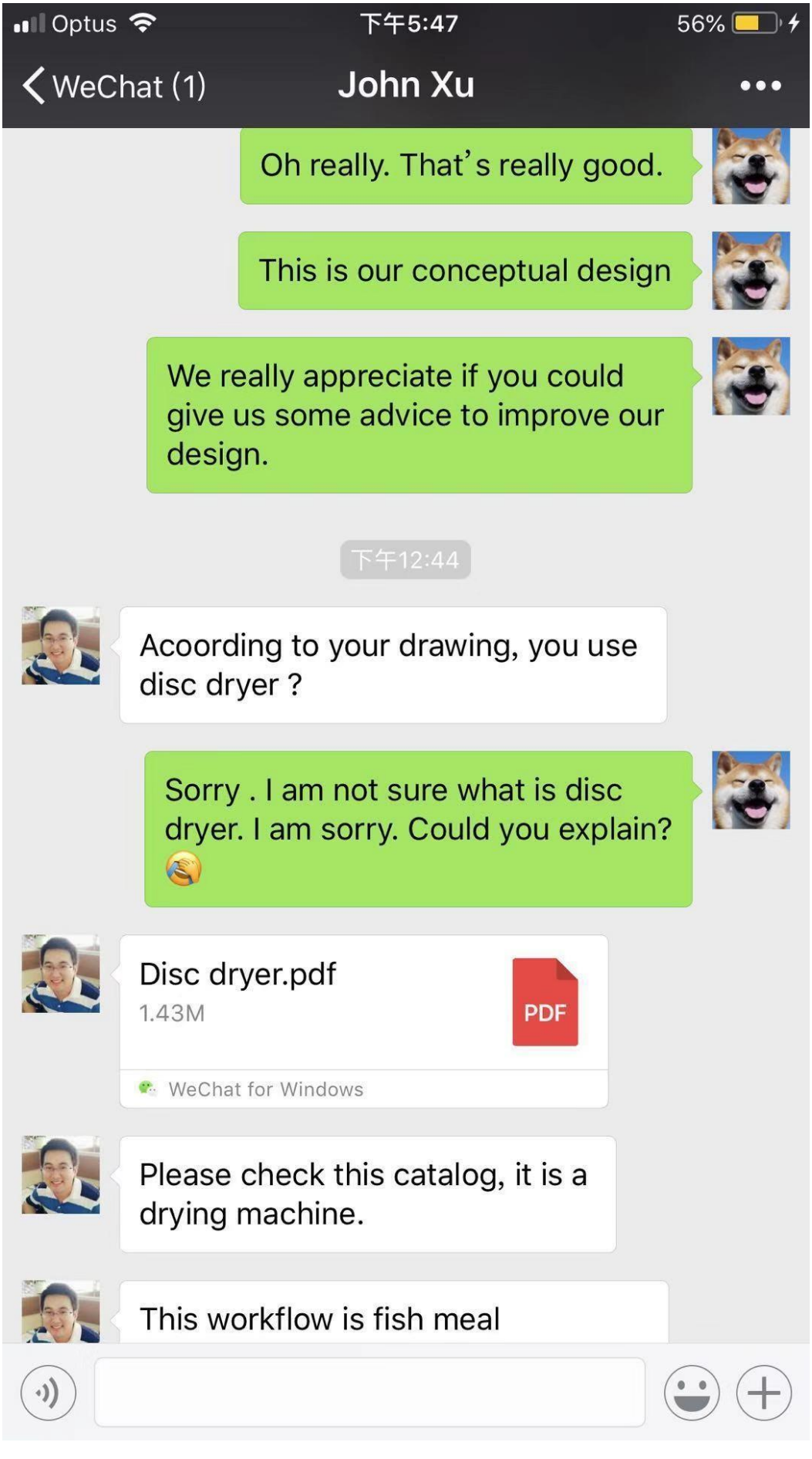
your material is same to our Singapore customer.

Your put larvae into machine ? Or you use our machine to dry powder ?

下午12:38

you need use batch cooker if you cook and dry insect. you use our disc dryer if you dry insect powder. Which type do you choose?




Optus
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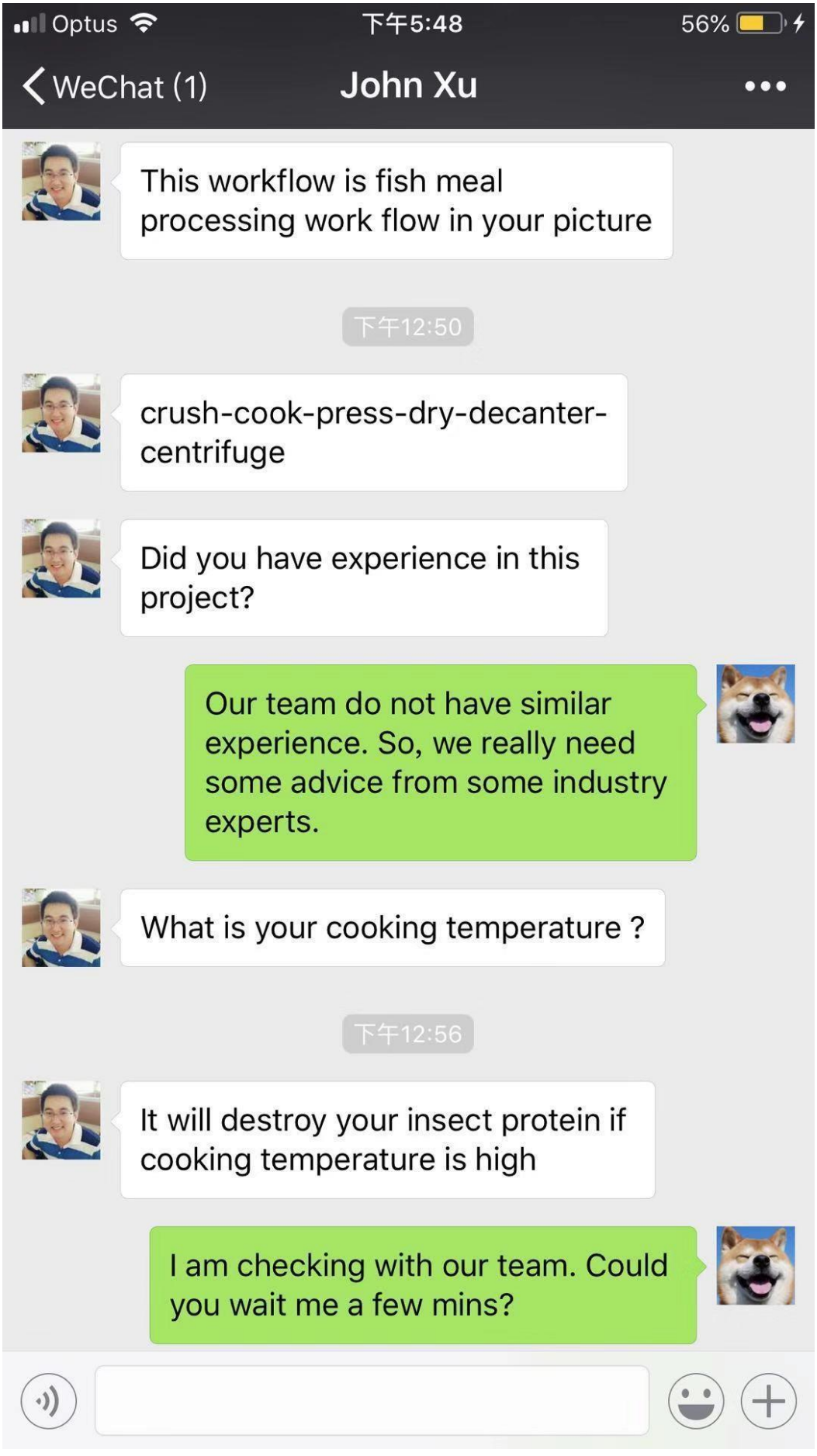
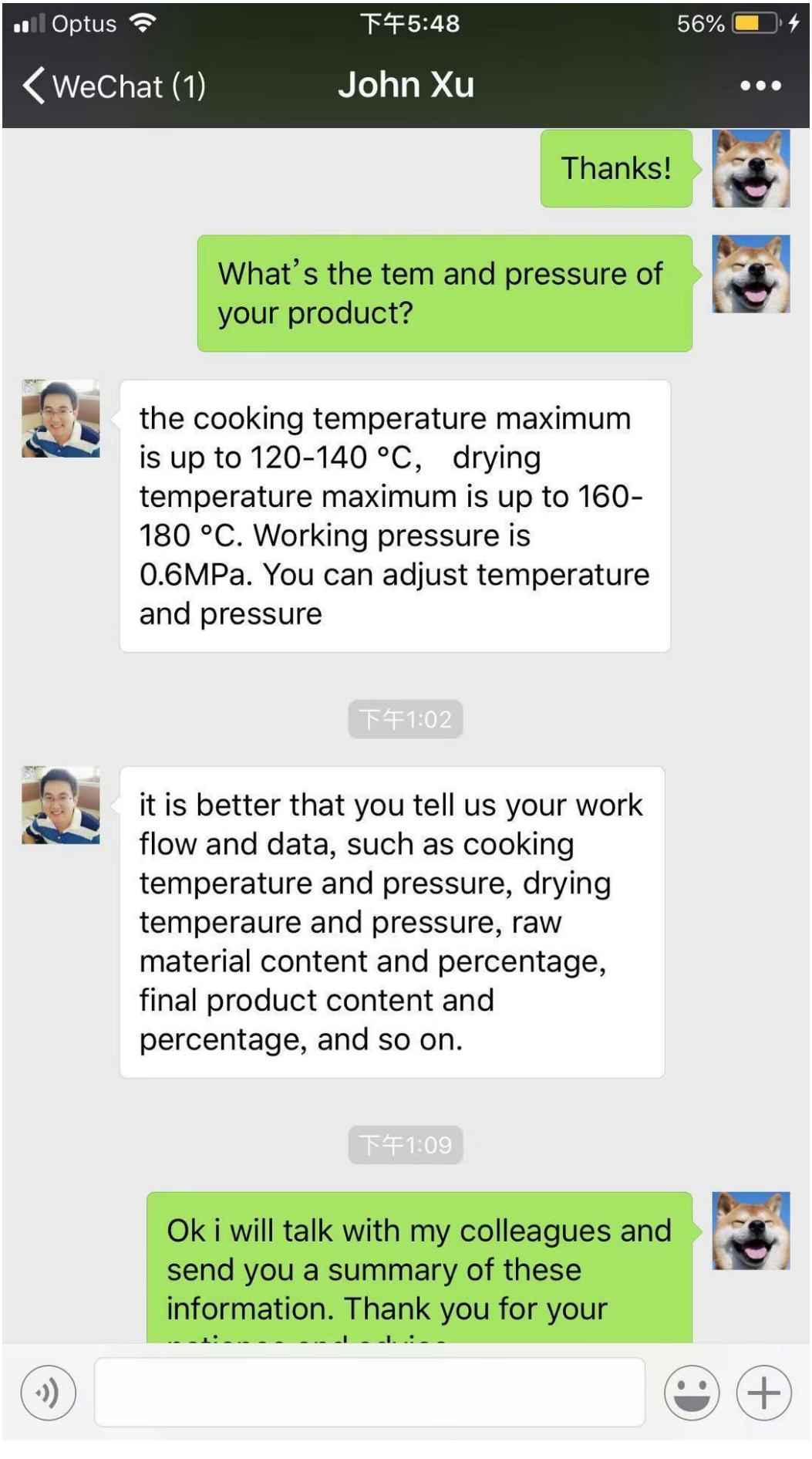
56%
WeChat (1)
John Xu
Oh really. That's really good.
This is our conceptual design
We really appreciate if you could give us some advice to improve our design.
下午12:44
Acoording to your drawing, you use disc dryer ?
Sorry . I am not sure what is disc dryer. I am sorry. Could you explain?
Disc dryer.pdf
1.43M
PDF
WeChat for Windows
Please check this catalog, it is a drying machine.
This workflow is fish meal


Optus
下午5:48
56%
WeChat (1)
John Xu
This workflow is fish meal processing work flow in your picture
下午12:50
crush-cook-press-dry-decanter-centrifuge
Did you have experience in this project?
Our team do not have similar experience. So, we really need some advice from some industry experts.
What is your cooking temperature ?
下午12:56
It will destroy your insect protein if cooking temperature is high
I am checking with our team. Could you wait me a few mins?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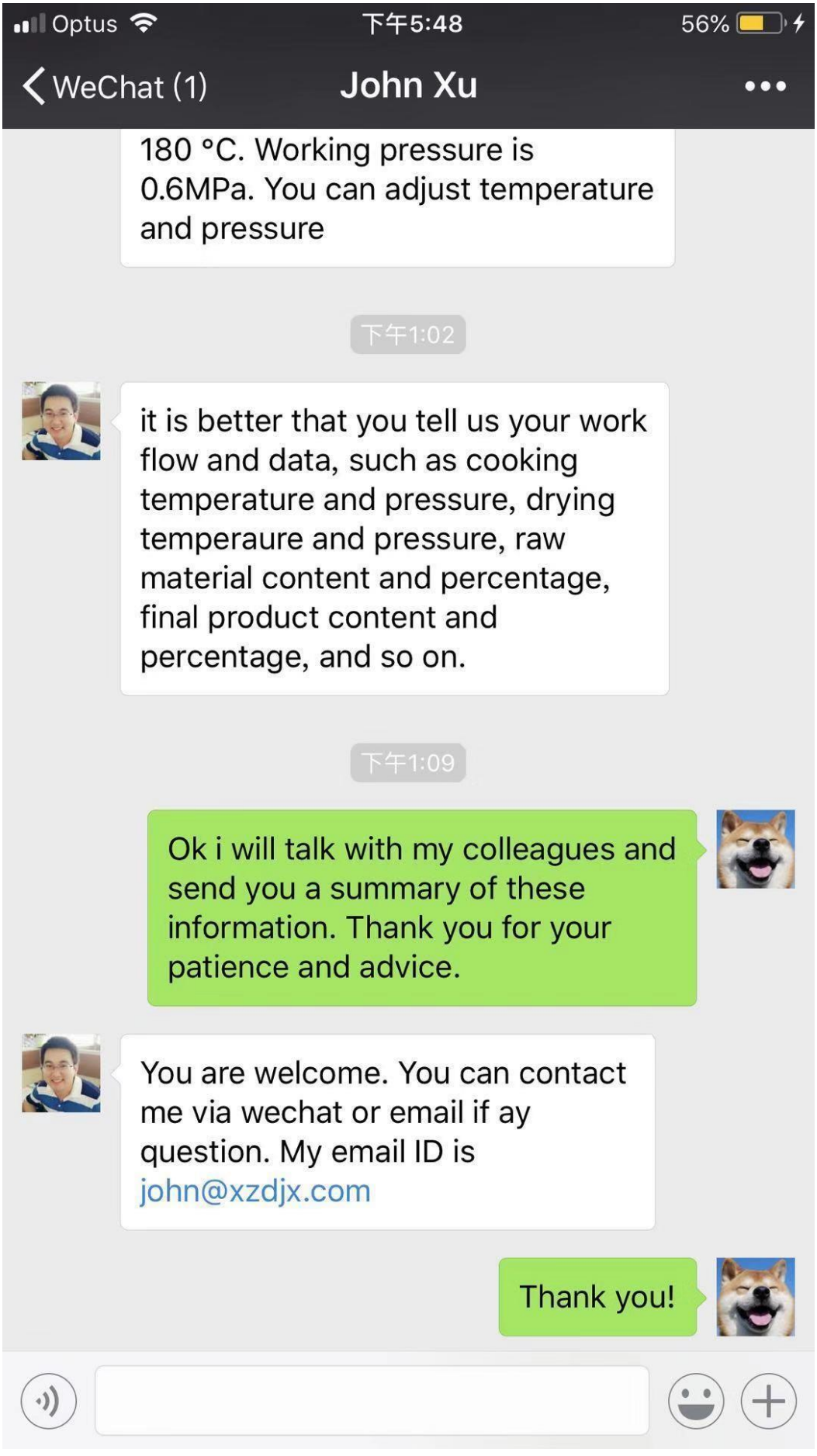
WeChat (1)
John Xu
Thanks!
What's the tem and pressure of your product?
the cooking temperature maximum is up to 120-140 °C, drying temperature maximum is up to 160-180 °C. Working pressure is 0.6MPa. You can adjust temperature and pressure
下午1:02
it is better that you tell us your work flow and data, such as cooking temperature and pressure, drying temperaure and pressure, raw material content and percentage, final product content and percentage, and so on.
下午1:09
Ok i will talk with my colleagues and send you a summary of these information. Thank you for your


Optus
下午5:48
56%
WeChat (1)
John Xu
180 °C. Working pressure is 0.6MPa. You can adjust temperature and pressure
下午1:02
it is better that you tell us your work flow and data, such as cooking temperature and pressure, drying temperaure and pressure, raw material content and percentage, final product content and percentage, and so on.
下午1:09
Ok i will talk with my colleagues and send you a summary of these information. Thank you for your patience and advice.
You are welcome. You can contact me via wechat or email if ay question. My email ID is john@xzdjx.com
Thank you!

Hi, I have already get some data. The pre-cooker temperature is 30-100 degree celsius and the pressure is about 10-15 psi. For the continue cooker, the temperature is about 120 degree celsius. Pressure is about 145 Psi.

For the raw material, larvae insect is about 70% to75% water.

The dry matter have 25%-35% fat (6.25%-12.25% of te total weight)

35%-45% protein (12.25%-15.75% of the total weight)

5-20% is chitin (1.25%-5% of the total weight)

From one tonne of larvae, we should get 700-750ml water

62-123 kg fat; 123-158kg protein 12.5-50kg chitin

16:03

For the working process, this is the schemetic diagram we drawn before.

we hope all the machines can work 24 hours a day and it can process one tonne insect per 8 hours.

this is fish meal process

Yes, I think the product can also feed the livestock based on the standards

But, we are not sure is it the best option for the process and what can we do to improve the process.

please see this workflow

I remebered you mentioned before, your customer from Singapora use the same raw material. Did they use the similar process to manage the insects?

Or totally differenct process?

when my boss mentioned the protein, I think it is the tallow.

I think the process you sent me for managing fish is still a little bit different with our designed process?

No, i advice him to use batch cooker. beacuase your cooked insect viscosity is very high. the fish meal press it twin-screw press, maybe has not effect to get oil

Do you mind explain a bit which component did you replaced by batch cooker?

Fat press?

No, it is same to your process, break fish , and then go to pre-cooker- dryer

"John Xu" recalled a message

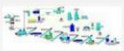
You dry insect, and then fat press?

Yes. Other manufactuers told us the insect must need to be dry before extracting the oil

So you should poultry rendering plant, not fish meal plant

Do you have machines which can be used in poultry rendering plant?

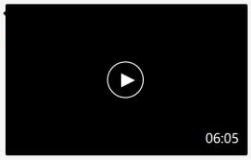
this is similar to your process. the batch cooker cook and dry insect in batch cooker



Yes, we have machine to be used for poultry rendering plant

I am a litte bit confused where is the meal (protein) output

the meal come out from press(榨油机)



please check this video

I have already checked this video. This is really cool. In our system, we want our oil from the fat press conitnuously go to decanter and separtor. Do you sell similar machines?

Yes, we have many customers in China and oversea, it mainly for poultry. We do not test insect. according to your information, i think you should use poultry rendering plant, not fish meal plant. So you need check this with your team.

Another question is we got most rendering plant are processing livestock. The size of the machine is extremely big. But, we are working on processing the insects. So, we are wondering is it possible to customize the size of the machines. Becuase we want our machine can fit in one or more modular units. So, most components need to fit in 40 feet shipping box.

Is it possible to explain a bit what is the key difference between the fish rendering plant and the poultry rendering plant? What the key difference of the funcion in the process?

Or, could you provide a video introduction of the fish meal plant

Although I think we should use the poultry rendering plant.

1. poultry rendering: cook and dry raw material in batch cooker(same machine) . fish meal: use cooker to cook raw material, use dryer to dry raw material powder.3. poultry rendering use single screw press, fish meal use twin screw presss 4. poultry rendering work as batch, normally one batch working time is about 4 hours. finish one batch, start other batch. fish meal work continuously. 5. poultry rendering is suitable for chicken,pig, feather and animal offal. fish meal plant is suitable for fish and fish offal

let me find a video for you

That's will be really helpful. Thank you so much!

You are welcome

Please check this video, maybe it will be helpful

what is the product composition difference between poultry rendering plant and fish meal plant?

is it possible for the poultry rendering plant to work 24 hours per day?

product composition is same, composition denpend on raw material

The poultry rendering plant can work for 24 hours, has 6 batch work.

I got the batch machine use high temperature and high pressure to dry the material. How does the dryer in the fish meal plant work?

The fish meal dryer also use high temperature to dry raw material

the temperature is higher when steam pressure is higher between dryer disc

Is it possible to customize the size of each components?

now our poultry rendering minimum input capacity is 1 ton. What is your input capacity?

we want our rendering plant to process one ton insect per 8 hours.

I think one ton will be fine.

You can use our smallest size, one ton input capacity , need about 4 hour to process them.

This sounds really good.

Can we have some more specifications and engineering drawings of each components?

i can send you some specifications

It will be the best if it can be like the PDF you sent me before

and a overall plant design

this is our design for our china customer

It seems like the overall deisgn can fit in two modular unit?

Yes, put them into two 40" HQ containers

Can we get some more dimension specifications? Our boss need the engineering drawing for each component in 2D and 3D first and the overall design drawings first.

Did you do any evaluation and testing before you built the physical prototype?

Did you do the simulation before to simulate the overall process?

We have more than 30 customers in China, machine work very well. Do not worry the machine running effect.

But your raw material is insect, we do not test it.

You can take your insect to our customer site to test if you can prepare insect in china.

Oh, that's will be great.

One more question is does the whole system can automatically control?

Yes, it you need automatic control , we can design for you, use one computer to control all machines, but the cost will be higher than ordinary control

So, based on the picture I sent you before. It only can be fish meal plant or poultry rendering plant? My boss is wondering is there any process can achieve it?

this is fish meal plant work flow

For the prototype picture, is it for poultry rendering plant?

which picture?

this one

yes, poultry rendering plant, can process pig, cow, chicken, offal, meat etc.

make them to meat and bone meal as protein , just like insect powder.

So, if we can send the raw material insects to you. Could you test it?

yes, but we need about 3 ton insects, and pay testing fee to our customer. It is ok for you?

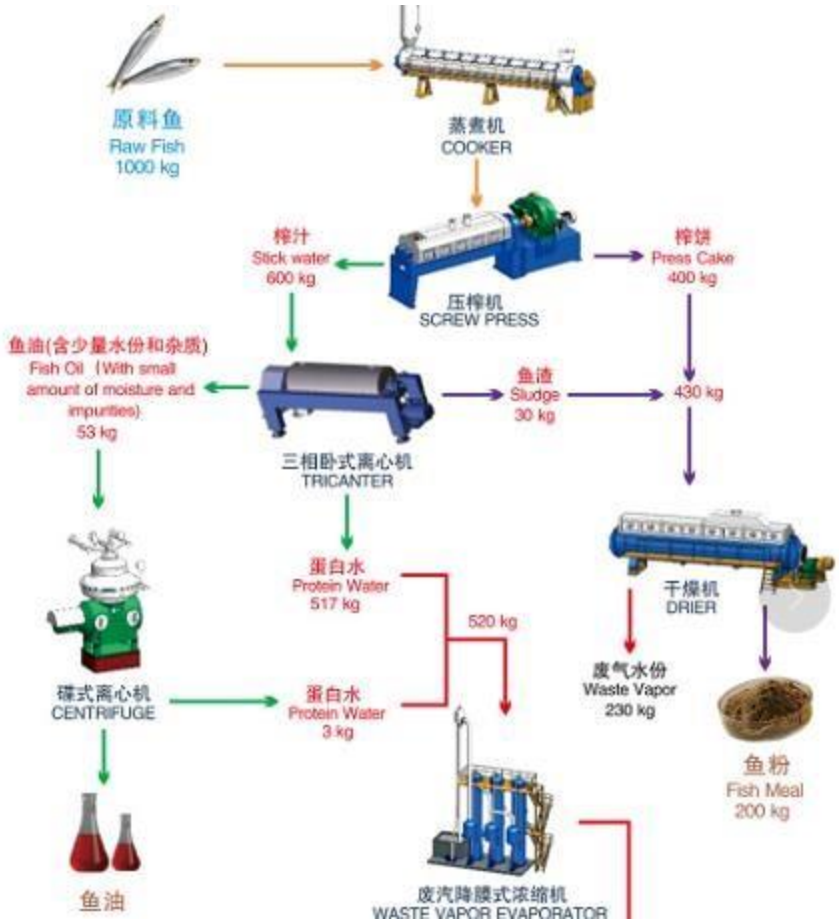
I will talk with my boss.

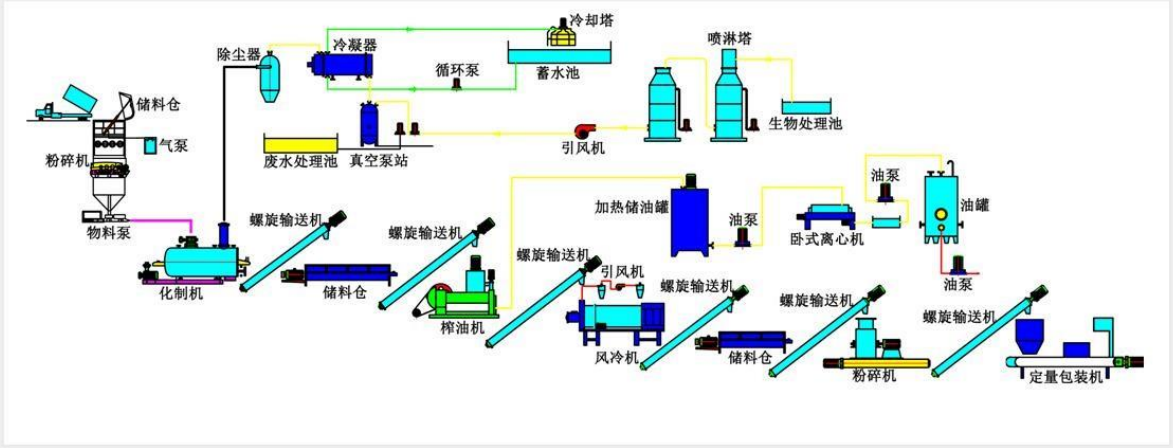
ok

Another question is for the mobile rendering plant you have already completed. How many batch are they? Is it possible to work continuously?

17:42

yes, we sent mobile rendering plant to our customer, and machine start work in customer site. We also are manufacturing them in our factory shop. it is 2 ton and 7 ton per batch. one batch cooker can not work continuously. you can prepare 2-3 batch cookers if you want them to work continously. for example, batch cooker 1 work stop , batch cooker 2 start work.


原料鱼
Raw Fish
1000 kg
蒸煮机
COOKER
榨汁
Stick water
600 kg
压榨机
SCREW PRESS
榨饼
Press Cake
400 kg
鱼油(含少量水份和杂质)
Fish Oil (With small amount of moisture and impurities)
53 kg
三相卧式离心机
TRICANTER
鱼渣
Sludge
30 kg
430 kg
蛋白水
Protein Water
517 kg
520 kg
干燥机
DRIER
碟式离心机
CENTRIFUGE
蛋白水
Protein Water
3 kg
废气水份
Waste Vapor
230 kg
鱼粉
Fish Meal
200 kg
鱼油
废汽降膜式浓缩机
WASTE VAPOR EVAPORATOR


冷却塔
除尘器
冷凝器
循环泵
蓄水池
喷淋塔
储料仓
气泵
粉碎机
废水处理池
真空泵站
引风机
生物处理池
油泵
加热储油罐
油泵
卧式离心机
油罐
物料泵
螺旋输送机
螺旋输送机
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引风机
螺旋输送机
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化制机
储料仓
榨油机
风冷机
储料仓
粉碎机
定量包装机