



2007 Credit Suisse China Energy Trip

BIODIESEL COST ANALYSIS

26 March 2007, Grand Hyatt Beijing

William Kao, CEO

高资明

**COBRA, a division of Pro-Tek (Xiamen) Electroplating Development Ltd.,
生物柴油部, 先锋 (厦门) 电镀开发有限公司**

Content

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PROBLEMS

The COBRA Process

Introducing COBRA

History of Biodiesel in China

Begun with Professor Din, Fuzhou University. Technology is an extended application of Fatty Acid distillation and purification plants

2001, Hainan Zhenghe operational

2002, Hebei Zhenghe begins construction

2002, Sichuan Gushan operational

2003, Longyan New Energy Zhuoyue operational

2003 Summer, Power shortage caused rush on diesel. Brown out still continue in Guandong Province

2004, Fujian Gushan begins construction

2005, SinoPec and China Petroleum forms a pact, 'Diesel Inverse Pricing' policy begins. Wholesale price higher than retail price. Wholesalers turn to biodiesel to retain profit

History of Biodiesel in China

2005, A flood of 100,000+ T/year projects are proposed across China

2005, Diesel hoarding begins

2005 Summer, Typhoon caused diesel supply shortage in the southern provinces.

2006 January, Gutter oil at RMB 1800/T

2006 March 26, China retail diesel price increased from RMB 4.05/L to RMB 4.19/L. Pricing inverse worsen, wholesale demand for biodiesel increase

2006 April, International oil price reaches USD 70 per barrel

2006 May 26, China retail diesel price increased from RMB 4.19/L to RMB 4.64/L

History of Biodiesel in China

2006 July, International oil price reached all time high USD 78 per barrel. Biodiesel wholesale price at all time high RMB 5100/T

2006 September, Gutter oil priced at RMB 3200/T

Today

2006 September, International oil price drops below USD 70 per barrel

2006 October, International oil price at USD 62 per barrel, smuggled diesel enters Chinese market

2006 October 15, biodiesel market crashing, smuggled diesel price RMB 4900/ T, non-spec diesel is even cheaper. Biodiesel is no longer favored due to density, use and profit considerations

2006 October 30, biodiesel wholesale price RMB 4700/ T

2006 December, Sinopec and ChinaPetroleum breaks pact, wholesale price falls below retail price

2006 December, many plants are closed due to market and winter issues

2007 March, many new plants begin production

But more 250,000+ T per year are proposed

Government Incentives

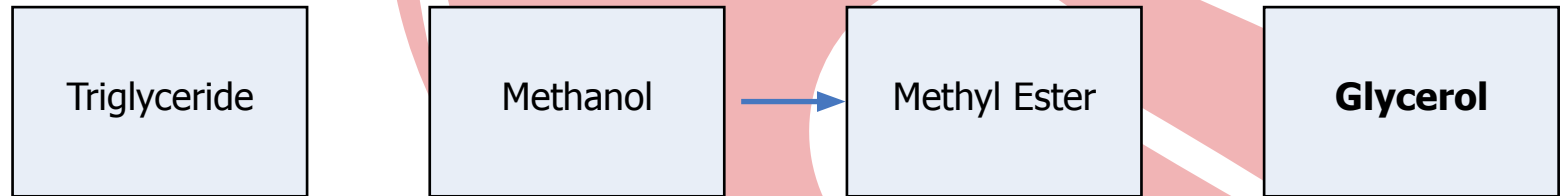
No laws regulating Biodiesel

No standard

Not restricting Biodiesel Export

Encourages high technology, sustainable, renewable and environmentally friendly investments

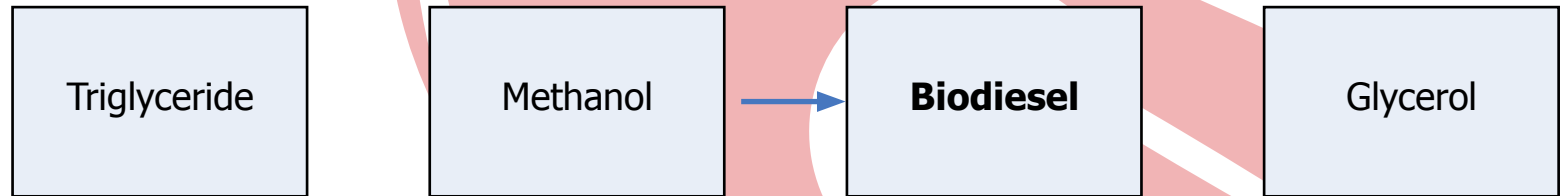
Producing Biodiesel



1945 August 28, US Patent 2,383,579, Patent awarded to Inventors Harold Dwaine Allen and William Ashley Kline, researchers at Colgate-Palmolive-Peet

Glycerol was the product, Methyl Ester was the side product

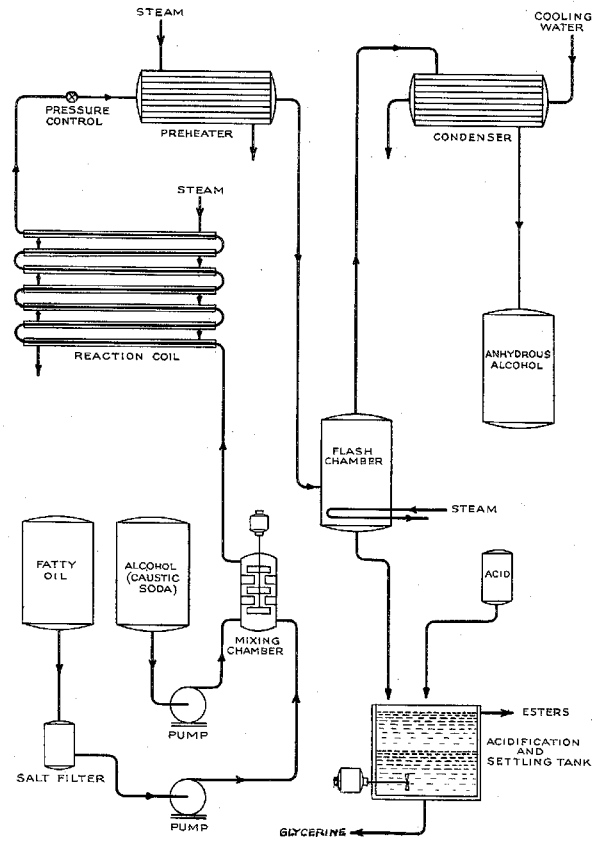
Producing Biodiesel



Fatty Acid Methyl Ester (FAME), C17-C19 and mineral Diesel, C14-C20, has similar material properties

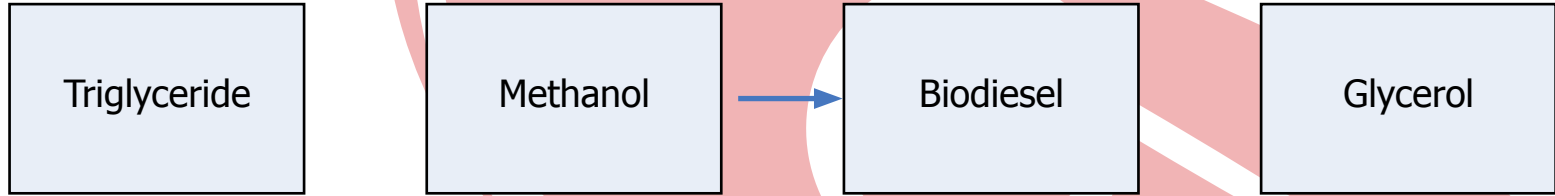
US Patent 2,383,579

Aug. 28, 1945. H. D. ALLEN ET AL 2,383,579
PROCESS FOR TREATING PATS AND FATTY OILS
Filed March 30, 1943



INVENTORS
HAROLD DWAIN ALLEN
WILLIAM ASHLEY KLINE
BY *[Signature]*
ATTORNEY

Producing Biodiesel



Mass (kg)	995	108	1000	103
Unit Price (RMB/1000 kg)	3200	3650	5447*	4408
Cost (RMB)	3180	394.20	5447*	454.02

Gross Profit RMB 2326.82

* Calculated based on Xiamen Sinopec #0 Diesel Pump Price, RMB 4.63/L

But Biodiesel is not Diesel

Diesel

Biodiesel

Mass (kg) 1000

1000

Unit Price (RMB/L) 4.63

4.63

Density 0.85

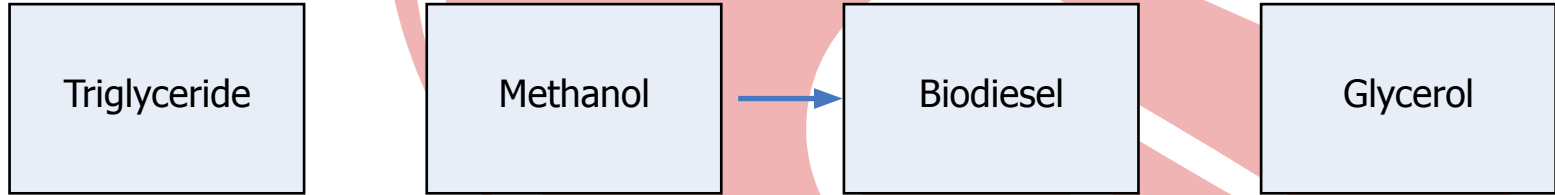
0.88

Volume (L) 1176

1136

RMB 5216/T at the pump

and the reality is cruel

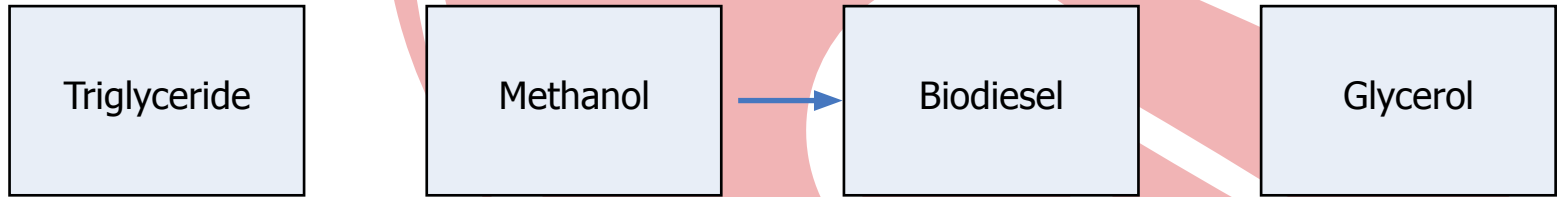


Mass (kg)	1111*	216	1000	327
Unit Price (RMB/1000 kg)	3200	3650	4700	0
Cost (RMB)	3555.20	788.40	4700	0

Gross Profit RMB 356.40

***90% Yield**

Taxation without Representation



	Triglyceride	Methanol	Biodiesel	Glycerol
Mass (kg)	1111*	216	1000	327
Unit Price (RMB/1000 kg)	3200	3650	4700	0
Cost (RMB)	3555.20	788.40	4700	0
VAT (17%)	0	134.03	799	0

Gross Profit RMB -308.57

***90% Yield**

Not all Feedstock is equal



Not all Feedstock is equal



All kinds of Feedstock

COBRA Feedstock Library



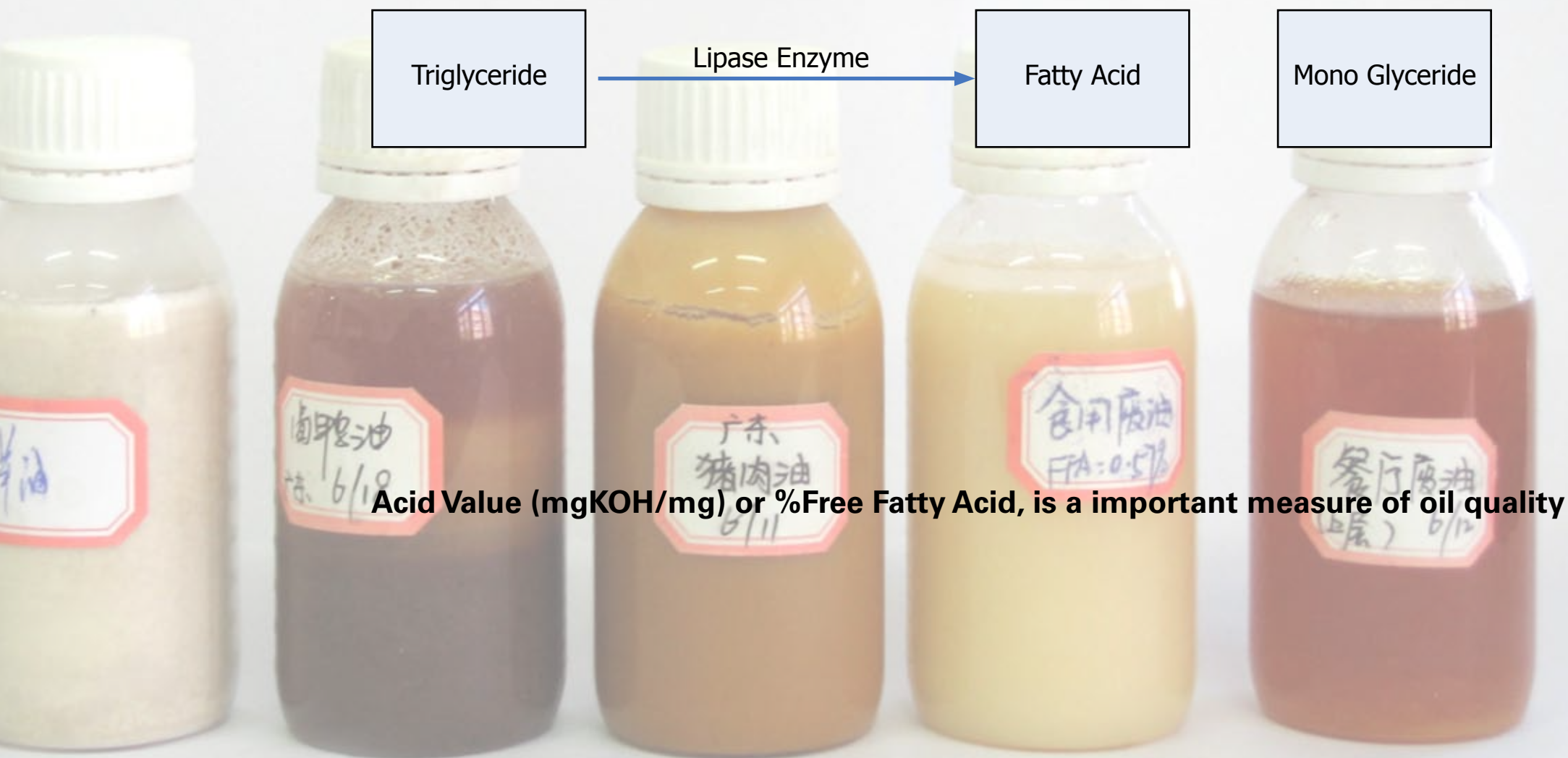
现在的原料 Today's Feedstock



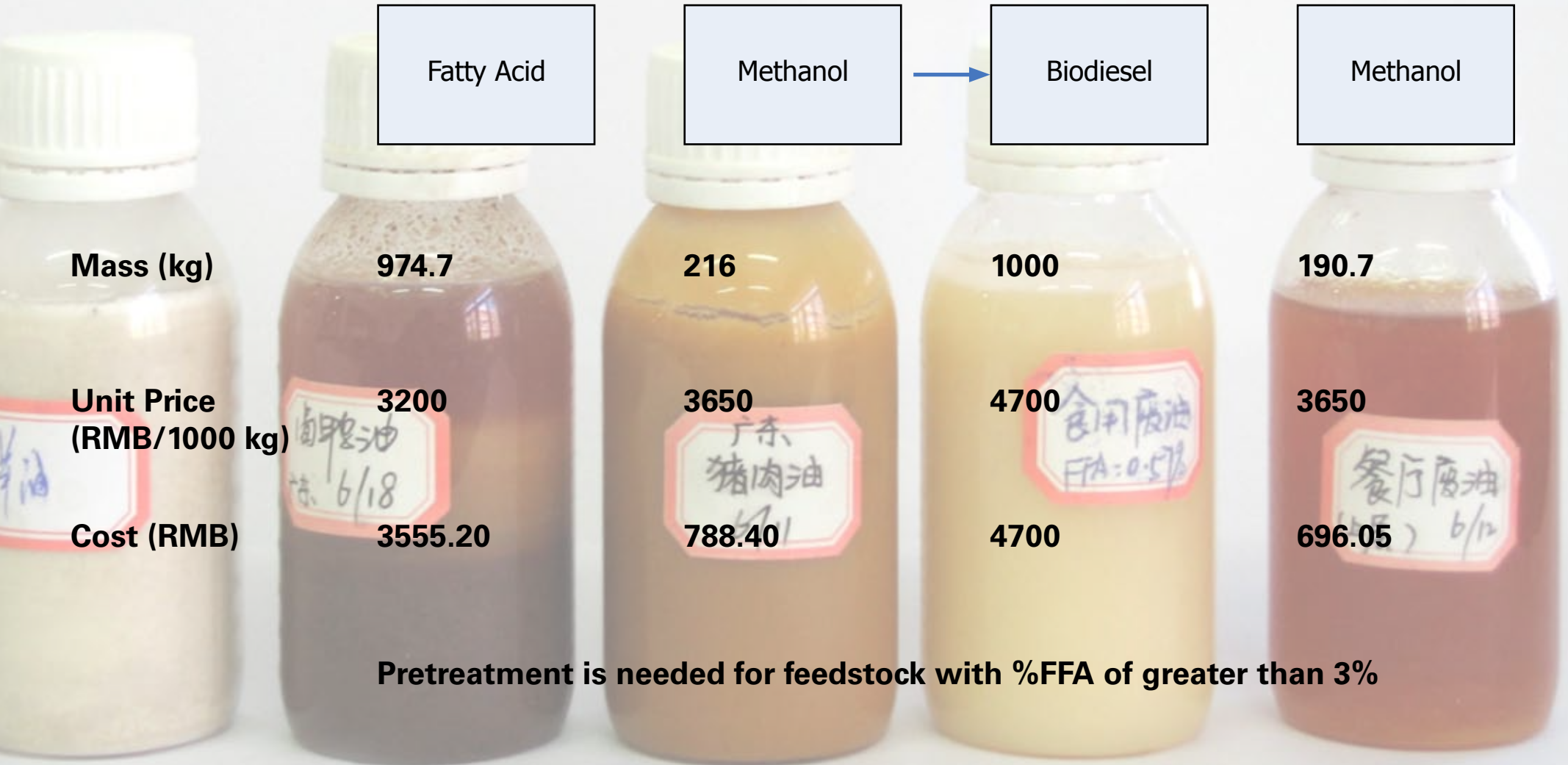
现在的原料 Today's Feedstock



What happens to old oil

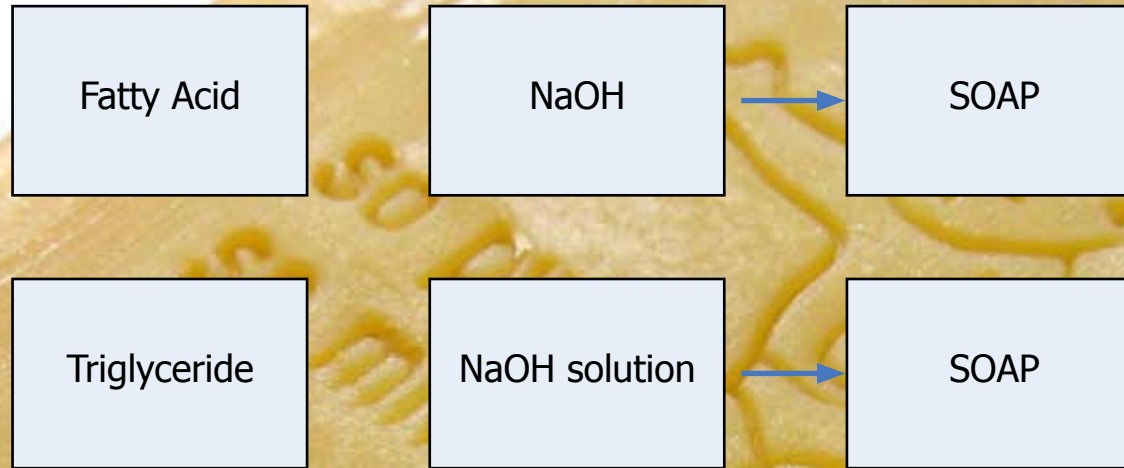


Pretreatment



Pretreatment is needed for feedstock with %FFA of greater than 3%

Counter Reactions



Soap is not fuel

Mr. Cai Biodiesel





清大科码科技有限公司



生物柴油 复合柴油

清华技术领先全国

全球石油资源已近枯竭
开发可再生资源迫在眉睫!
生物液体燃料的出现
带来了石油市场璀璨的新曙光!

详情点击进入

废塑料 废轮胎 废机油

废物堆里炼出的黄金万两

旋转炼油机采用全新结构360°C整体旋转中轴线出油气，逆向自动排渣，滑动翻料等有一系列独到设计。进出料系统采用高强度无泄露装置，密封性、安全性极佳。

详情点击进入

To be profitable

TAXES (VAT, Consumer Tax, Fuel Tax, Income Tax ...etc)

Secure Steady Supply of Feedstock

Reduce Price of Feedstock

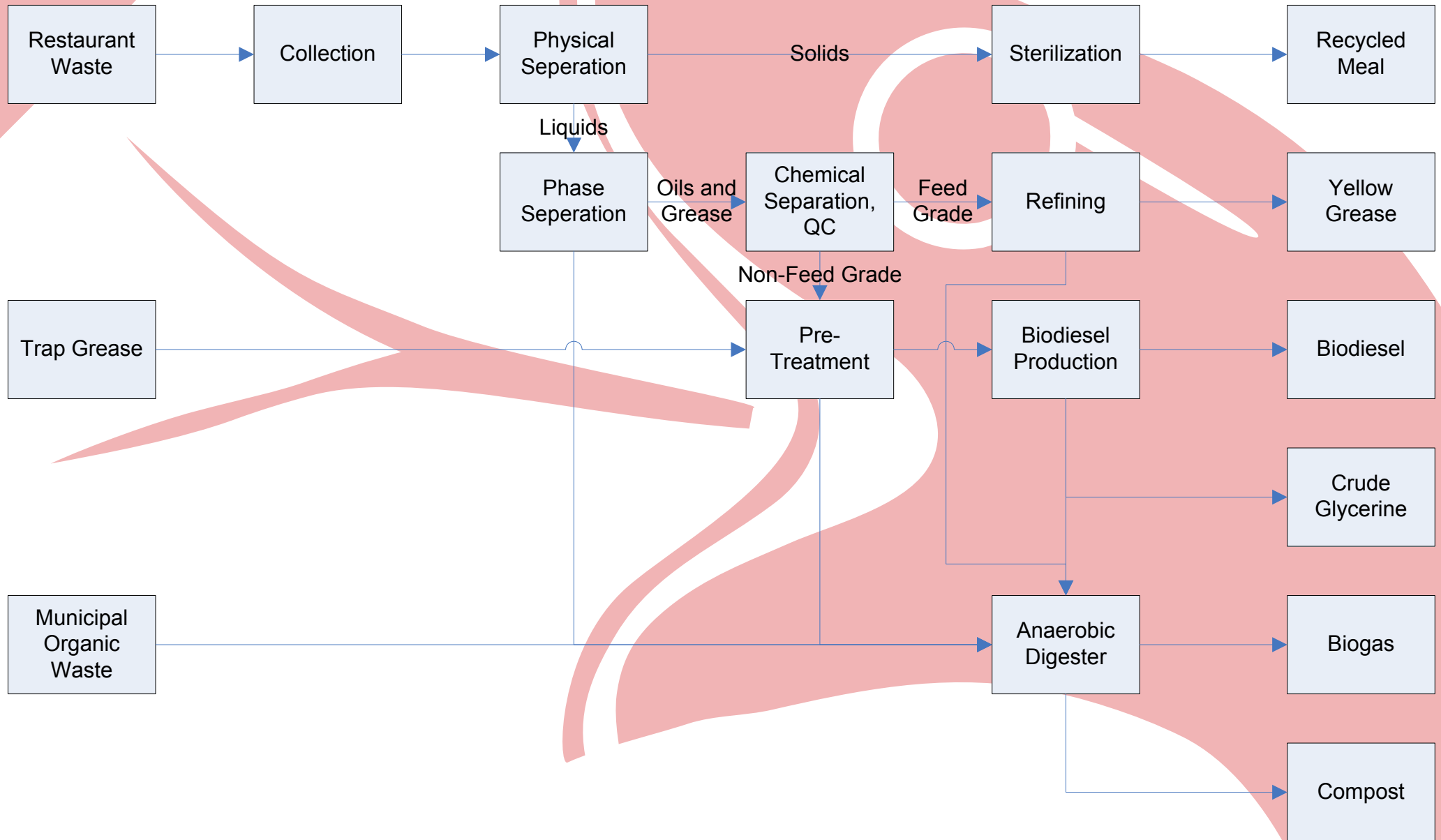
Reduce Transportation cost

Increase Biodiesel Price

Need Biodiesel Material, Production and Application standards and best practices

VERTICAL INTEGRATION

The COBRA Process



ASTM Certified



SPECTRA Laboratories

2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

06/09/2006

Pro-Tek Development and Investment Co.
Guannan Industry Zone
Guankou, Xiamen,
People's Republic, China 361023
Attn: Department of Biodiesel-William Kao

Project: China Red
Client ID: China Red
Sample Matrix: Fuel
Date Sampled:
Date Received: 05/02/2006
Spectra Project: 2006050071
Spectra Number: 1

Analyte	Result	Units	Method
90%	297	°C	ASTM D-1160
Copper Strip Corrosion	1-A	classification	ASTM D-130
Conradson Carbon	0.015	wt. %	ASTM D-189
Cloud Point	11.1	°C	ASTM D-2500
Bot. Sediment and Water	<0.05	% volume	ASTM D-2709
Total Sulfur	0.004	% mass	ASTM D-3120
Viscosity, Kin, @ 40 °C	4.2	cSt	ASTM D-445
Phosphorus Content	<0.0001	% mass	ASTM D-4951
Free Glycerin	0.001	% mass	ASTM D-6584
Total Glycerin	0.017	% mass	ASTM D-6584
Total Acid #	0.16	mgKOH/g	ASTM D-664
Sulfated Ash	0.0015	% mass	ASTM D-874
Flashpoint (PMCC)	166	°C	ASTM D-93



42605
MICHAEL
KAO
DATE SIGNED: 6/2/06
ARIZONA U.S.A.




CERTIFICATE NO.
41785
ALEXANDRA B.
ETHERIDGE
DATE SIGNED: 6/2/06
ARIZONA U.S.A.

SPECTRA LABORATORIES



Steve Hibbs, Laboratory Manager
as5kan



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B20 passes GB 252-2000 standard



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检测报告

TEST REPORT

编号 No.	262565
样品名称 Sample Description	B20
型号规格 Type, Specification	0号
受检单位 Inspected Entity	先锋(厦门)电镀开发有限公司
委托单位 Applicant	先锋(厦门)电镀开发有限公司
检验类别 Test Type	委托检验

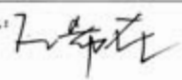
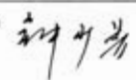
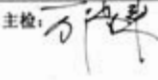
广东(惠州)石油产品质量监督检验中心
广东省惠州市石油产品质量监督检验中心
Guangdong Huizhou Testing Centre for Petroleum Products Quality

2006年 月 日 (Y/M/D)

检测报告

No. 262565
第3页 共4页

样品名称	B20	型号、规格、等级	0号	
受检单位	先锋(厦门)电镀开发有限公司		检验类别	委托检验
委托单位	先锋(厦门)电镀开发有限公司		邮政编码/电话	361023 0592-6380558
委托单位地址	厦门市集美区灌口镇灌南工业区		抽样基数	—
供货单位	先锋(厦门)电镀开发有限公司		样品数量	2.5L
来样日期	2006-10-12	来样方式	寄送	来样/按样单号 0001501
检验依据	GB 252-2000《轻柴油》、GB/T 384-1981(88)等。			
检验结论:	<p>该样品检验项目: 色度、氧化安定性、硫含量、酸度、10%蒸余物残炭、灰分、铜片腐蚀、水分、机械杂质、运动粘度、凝点、冷滤点、闪点、馏程、十六烷指数、密度、热值。 所检项目符合0号轻柴油质量指标要求。</p>			
 检验日期: 2006年10月14日				
未经本中心书面批准, 不得复制本报告(完整复制除外)。				
附注: 1. 样品状态: 样品塑料瓶装。 2. 检测仪器: 闪点测定器、硫含量测定器等。 3. 检测环境条件: 27~30 ℃, 70~78 %RH 4. 检测结果的不确定度(必要时填写): 5. 偏离情况(必要时填写): 6. 抽样情况(必要时填写): 7. 其他:				

授权签字人:  审核:  主检: 

检测报告

No. 262565
第4页 共4页

序号	检验项目	检验依据	质量指标	检验结果	单项结论
1	色度, 号	GB/T 6540	≤3.5	2.5	合格
2	氧化安定性, 总不溶物 mg/100mL	SH/T 0175	≤2.5	0.6	合格
3	硫含量, % (m/m)	GB/T 17040	≤0.2	0.13	合格
4	酸度, mgKOH/100mL	GB/T 258	≤7	6.6	合格
5	10%蒸余物残炭, % (m/m)	GB/T 268	≤0.3	0.058	合格
6	灰分, % (m/m)	GB/T 508	≤0.01	0.001	合格
7	铜片腐蚀(50℃, 3h), 级	GB/T 5096	≤1	1a	合格
8	水分, % (V/V)	目测	≤痕迹	无	合格
9	机械杂质	目测	无	无	合格
10	运动粘度(20℃), mm ² /s	GB/T 265	3.0~8.0	4.994	合格
11	凝点, ℃	GB/T 510	≤0	<-2	合格
12	冷滤点, ℃	SH/T 0248	≤4	-4	合格
13	闪点(闭口), ℃	GB/T 261	≥55	67	合格
14	馏程	GB/T 6536			
	50%回收温度, ℃		≤300	295.5	合格
	90%回收温度, ℃		≤355	344.0	合格
	95%回收温度, ℃		≤365	356.5	合格
15	十六烷指数	GB/T 11139	≥45	50	合格
16	密度(20℃), kg/m ³	GB/T 1884 GB/T 1885	实测	853.0	—
备注	热值, Cal/g, 总热值 净热值	GB/T 384	—	9370 9070	— —

审核: 

主检: 

COBRA Grease Monkey 1



COBRA Grease Monkey 1



COBRA Grease Monkey 1



COBRA Grease Monkey 1



COBRA Grease Monkey 1



油猴一号

COBRA Grease Monkey 1

Begin operations in May 2007

Privately funded, Budget USD 1.2 million

30T per day capacity

Developing Crude Glycerine applications

**On site waste water treatment available and developing
Biodiesel specific Biogas digester and Biogas applications**

Biodiesel Research Platform



COBRA Grease Monkey 2



COBRA Grease Monkey 2

Begun operations in January 2005

Equipment made by COBRA

3 T per day capacity

Open system pilot plant

Operator Education Center

80% Yield

Shenyang Kitchen Waste Recycling



Recycled Meal



Shenyang Kitchen Waste Recycling



Shenyang Kitchen Waste Recycling

Began trial operation December 2006

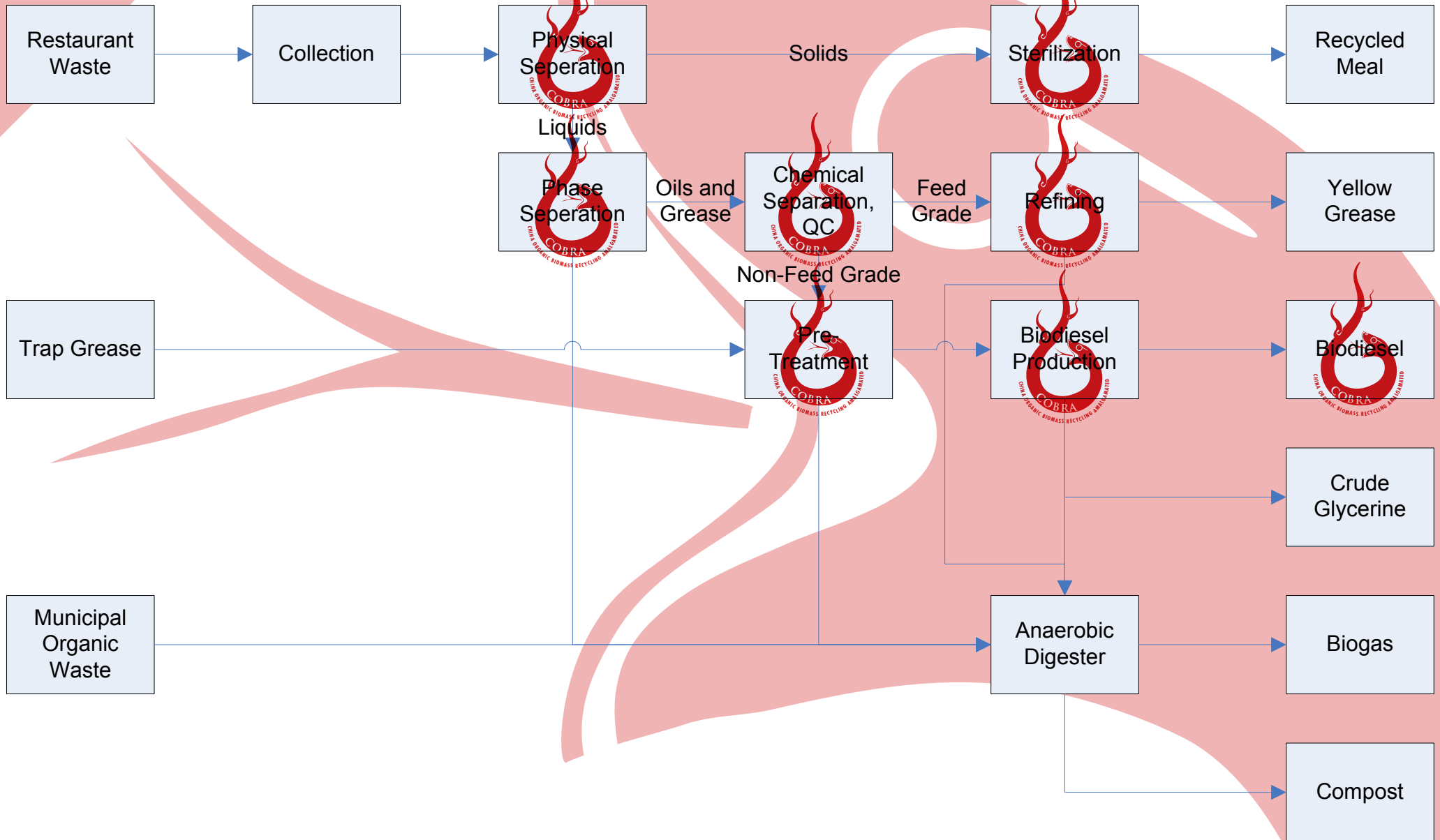
30 T per day of Kitchen Waste Treatment Capacity

Biogas potential is 52 cubic meter of Biogas per 1 T of waste water*. Kitchen waste is 70% liquid

Shenyang city generates 200 T of Kitchen Waste per day

***Institute of Clean Energy and Environmental Engineering & Liaoning Key Lab of Clean Energy**

Half way there



Tough Road ahead

Tax issues, subsidies issues

Who is in-charge ? and too many people in-charge

Without a standard, biodiesel is no different than non-spec diesel, lacks legal statuses

Vertical Integration is an uphill struggle

Overheated Industry, supply out of control and limited demand

Conclusion

Chinese biodiesel is an unregulated, free market, capital driven industry. Run away capitalism.

A complete opposite to the Chinese fuel ethanol industry

Chinese biodiesel industry is a mess, not helping anyone

Needs to be sustainable