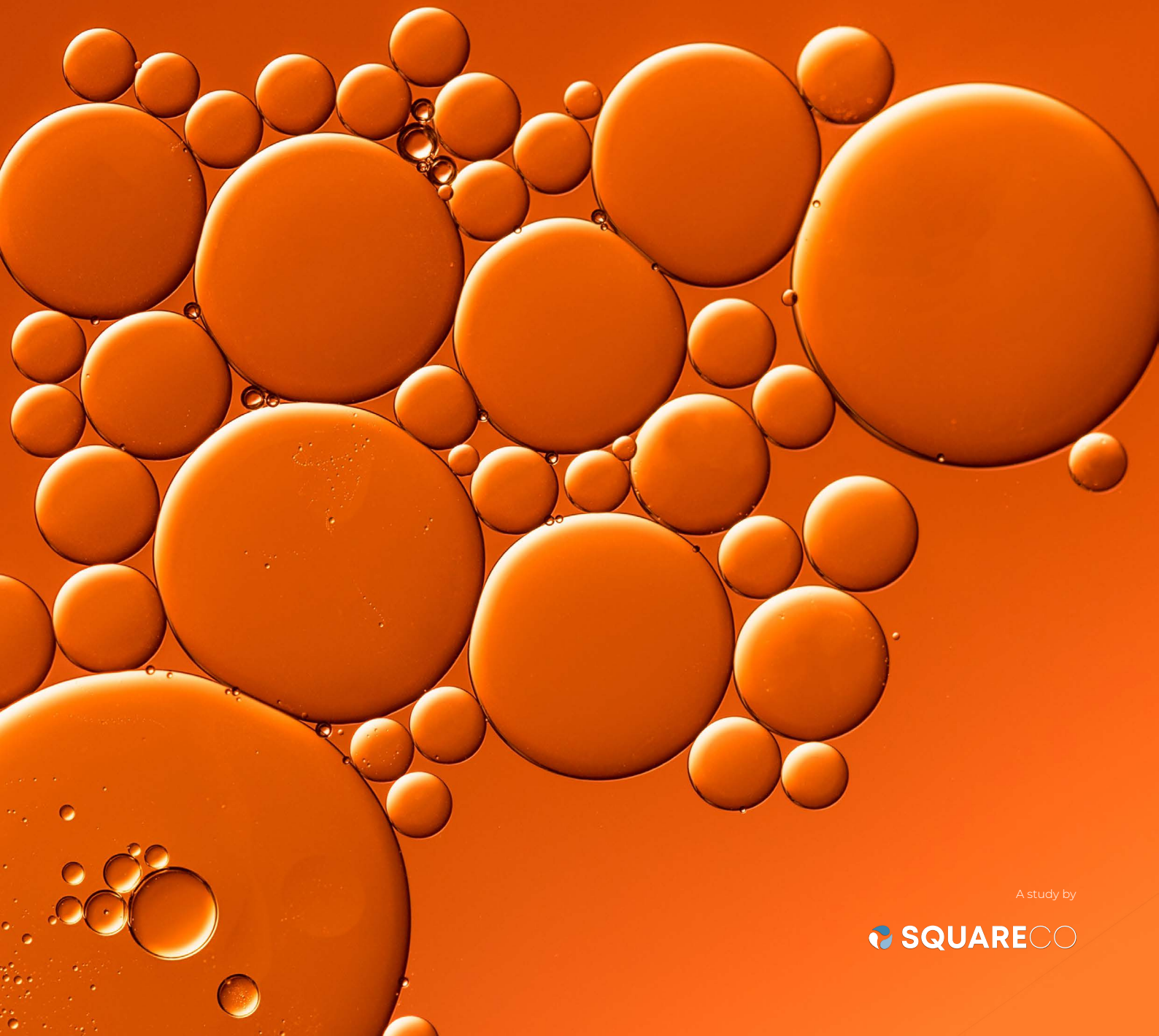
Excerpt *Version*

Annex 9B

Estimating UCO and Animal Fats supply potential

Edition 2022



A study by

SQUARECO

About SQUARECO

Based on the Leman Lake shores in Switzerland, SquareCo develops market intelligence solutions designed to help players active in **renewable fuels markets** to gain a deeper understanding of regulatory frameworks, market dynamics and industry developments.

SquareCo delivers high-quality expertise through the publication of articles, market reports and thematic studies displayed on our Web Platform. Our strong emphasis on data monitoring allows us to supply our clients with access to a comprehensively organized database.

We help energy suppliers to the road, maritime and aviation sectors to navigate serenely the complexity of regulations applying to low carbon fuels markets. Relying on 15 years of experience and an extensive network of contacts at ministries and companies around the world, we keep our clients constantly updated about the current and coming rules.

Abstract

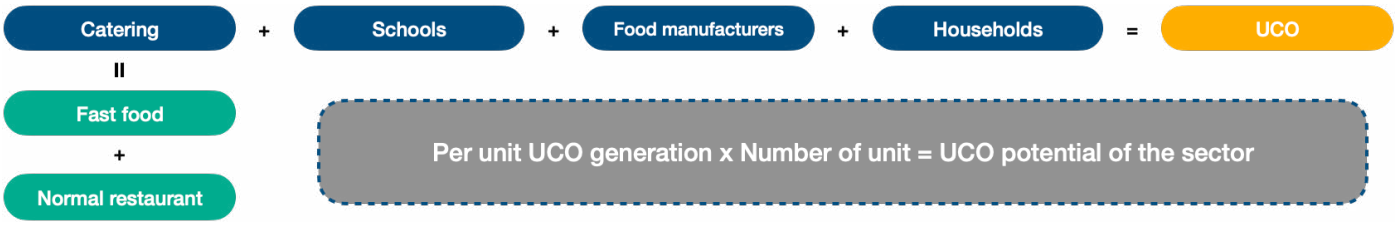
In this new study, SquareCo analysis team established methodologies to provide a realistic estimation of the potential used cooking oil (UCO) and animal fats quantities available globally for the biofuels industry.

UCO potential estimation

We selected 38 reference countries including China, Malaysia, Indonesia, Japan, Australia, the EU-27, the US, Canada, Mexico, Brazil, Chile, Saudi Arabia and the UAE. For each one of them, we scanned the scientific literature available and described in detail the system of UCO collection.

We tested two different methodologies to estimate the UCO potential for each country: one per sector, the other per waste yields. For most of the countries, the approach by sector proved to be the most relevant.

We formulated a series of assumptions based on the best studies we found for each country for the following sectors:



Since it holds the greater potential globally, we put a special emphasis on China (15 pages). To get a final "magic" number of the total UCO volume potentially available worldwide, we categorized countries not specifically covered by our study depending on their economic development, food market regulation and cooking style. From there, we established Food Vegetable Oil to UCO ratios that we applied to their consumption of fresh oils.

The result is a comprehensive estimation table with the UCO potential for 162 countries and a final estimation of the UCO potentially collectible worldwide.

Animal Fats

Based on official data from FAOSTAT, we developed a methodology to calculate animal fats' rates contained in the total slaughtered weights of six main livestock categories: sheeps/goats, pigs, cattle/calf and chicken.

We defined with precision the three categories (C1/C2/C3) and proposed a methodology to calculate the potential for each one of them, in Europe but also globally.

The result is an estimation of the potential quantities for each category, per continent.

Summary

Excerpt *Version*

Annex 9B

Understanding the Basics and Supply Potential for Biofuels

Part I

UCO

SQUARECO

Asia-Pacific

China

Chinese UCO collection system

The fast economic development since the 1980s and the improvement of people's living conditions have contributed to the exponential increase of food waste oil, which ultimately became a public health problem. Today, total kitchen oil waste is estimated at more than 10 million mt[1] in China, which makes it the country with the biggest potential in UCO worldwide.

Evolution of kitchen waste policy in China

The timeline of kitchen waste policy in China can be divided into 3 phases: before 2010, when no national regulation was enforced; between 2010 and 2017, when the government tried to regulate kitchen waste treatment; and from 2018, when it started to consider waste oils as a strategic bioenergy resource.

Wording warning

For China, this part of the study discusses the collecting chain of several kinds of waste cooking oils and grease, including UCO, brown grease, and food wastes. Locally, the term “UCO” was not used before exports started to the EU. The domestic Chinese market names one broader product as “Kitchen waste oil”. The terms of “UCO” and “Brown grease” have been used recently to facilitate the export business.
Local people call the best quality of “Kitchen waste oil” as “swill oil”, which is the closest definition of UCO in European standards. The lowest quality is named as “gutter oil” in Chinese version, which usually refers to a lower grade that includes brown grease.
It was not until December 2021 that “UCO” became a listed commodity in the Oil and Gas Trading Center of China, under the official commodity name of “Mixed industrial grease”.

Before 2010: no policy

Until 2010, there was no coordinated policy on kitchen waste in China. Formally organized grease collecting companies existed in a very limited number in some of the big cities. Beijing and Shanghai have been exceptions for a long time, implementing the first waste management systems already from 2005. At the national level, most of the waste oil generated by restaurants was collected by individual, illegal collectors.

The greases underwent a simple filtration process and most of them were retransferred into edible oil, also called "gutter oil", to be sold again to restaurants. This "underground chain" grew exponentially until it became a public health problem. Figure 1 shows the collecting chain for the first phase.

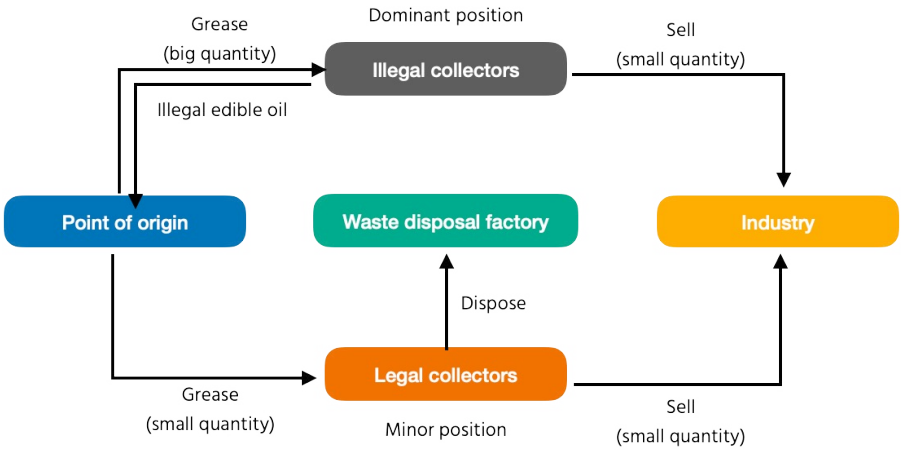


Figure 1: Collecting chain before 2010

2010-2017: Regulation of collection

In December 2008, the National Development and Reform Commission held a meeting on urban Food Waste Recycling and clarified the problems faced by China, but it was not until 2010 that
the government issued the first policy on kitchen waste at national level: "Opinions of the State Council on Strengthening Waste Oil Remediation and Kitchen Waste Management". Its main objective was to prevent the flow-back of gutter oil into food.

This policy considered for the first-time kitchen waste recycling as a public service to be managed and supervised by the government. It mandated all waste flow to be recorded, and all illegal collections to be fined. The government sent a strong signal that the collecting chain would be regulated and that illegal processing would be cut off.

In the same year, the central government also listed pilot cities in which to construct kitchen waste treatment factories, with 33 cities (Beijing, Shanghai, Harbin etc.) selected in the first round. From 2010 to 2015, new cities were progressively

added to the list to reach 100 cities running pilot kitchen waste treatment facilities in 2015.

Excerpt *Version*

Annex 9B

Understanding the Basics and Supply Potential for Biofuels

Part II

Animal Fats

SQUARECO

Global Potential

This section gives an analysis of the potential quantity of animal fats and tallow available worldwide.

Six principal livestock types were selected for the estimation: sheep/goats, pigs, cattle/calves and chickens. The method of our estimation is to calculate the animal fats from total slaughtered weight with a given fat rate of the live weight of a specific animal. All data are based on the 2019 data from FAOSTAT or other official statistics sources.

For all livestock, three weights could be distinguished in the animal rendering terminology:
- Live weight, which means the weight of a live animal before slaughter.
- Carcass weight or killed weight, referring to the body weight after slaughtering of livestock, by removing the head, hooves, hair (or skin), internal organs as well as other inedible parts. It is an important indicator, which reflects the level of meat yield. The carcass weight of various livestock are also different according to people's consumption of meat products.
- The fifth-quarter weight is the difference between the two first, includig all parts removed in abattoir; they mostly refer to animals by products, fats and wastes.

The main objective of our study is to estimate the total animal fat potential including the three categories listed by EC: Catefory I, category II and category III.

Selected preview content

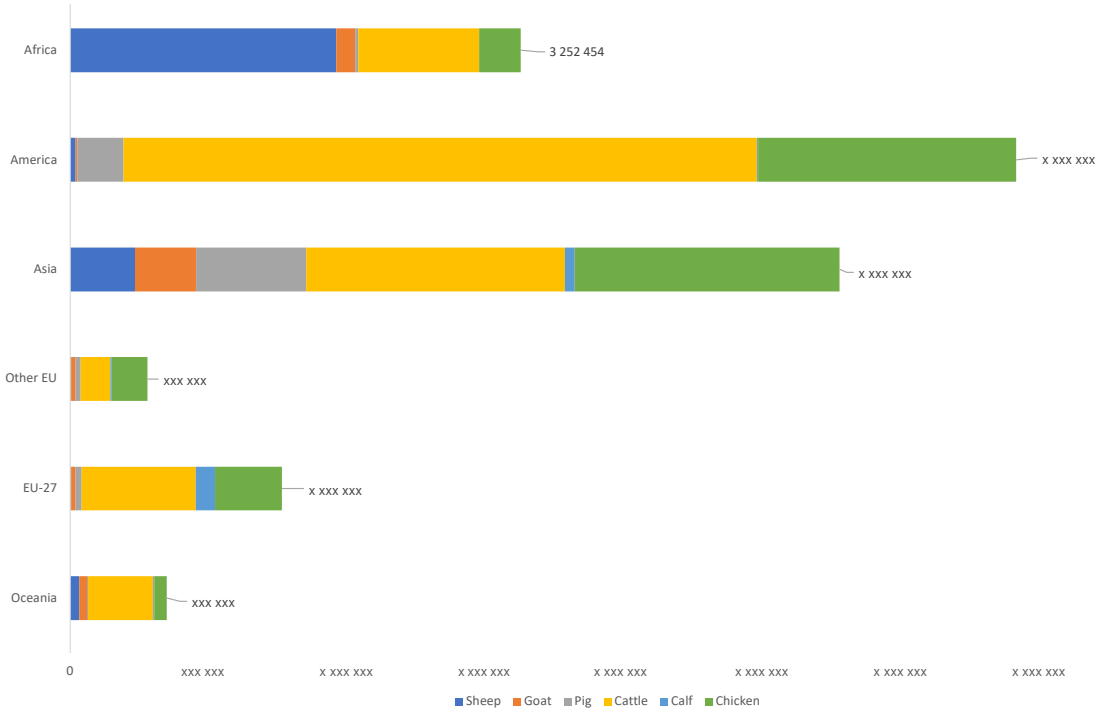
Canada

	Professional sector	Household sector
UCO potential (mt)	121 907	123 732
Collecte ratio (estm.)	95%	60%
Potential collect (mt)	115 812	74 239
Total potential collect (mt)	190 051	
Global collectability	77%	

Table 42: UCO collectability in other countries

Country	Professional collect (%)	Household collect (%)	UCO total(mt)	Professional UCO (mt)	Household UCO (mt)	Professional collect (mt)	Household collect (mt)	Total collect (mt)
Afghanistan	65	30	22 500	12 375	10 125	8 044	3 038	11 081
Albania	85	50	6 900	3 795	3 105	3 226	1 553	4 778
Algeria	85	50	107 500	59 125	48 375	50 256	24 188	74 444
Angola	65	30	32 000	17 600	14 400	11 440	4 320	15 760
Argentina	85	50	441 840	243 012	198 828	206 560	99 414	305 974
Armenia	75	40	2 480	1 364	1 116	1 023	446	1 469
Azerbaijan	85	50	4 370	2 404	1 967	2 043	983	3 026
...	...	...	...	...	...	...	...	...
Zimbabwe	65	30	4 000	2 200	1 800	1 430	540	1 970
Total								**x xxx xxx**

Chart 18: Animal fats potential by region and type of animal (mt)



Excerpt *Version*

Contact us

SQUARE COMMODITIES SARL
Tel.: +41 21 801 50 18
admin@squarecommodities.com

EDITOR IN CHIEF
Olivier Pellegrinelli
olivier@squarecommodities.com
Tel: +41 79 676 88 87

VISIT US ON
www.squarecommodities.com

SQUARECO

Copyright & Disclaimer