

During the past few years, consumer behaviors have changed drastically because of the COVID-19 pandemic. A series of social-distancing measures aiming to mitigate the spread of the virus forced consumers to adopt new habits and lifestyle choices that influence how they live, work, and shop for their needs. These changes have prompted businesses to align their strategies to meet the consumer's expectations.

Thailand leveraged the opportunities at the Thai Pavilion featured at the International Horticultural Expo to showcase the country's food products and conduct a study on Dutch consumer behavior to understand the purchase patterns and preferences of different consumers.

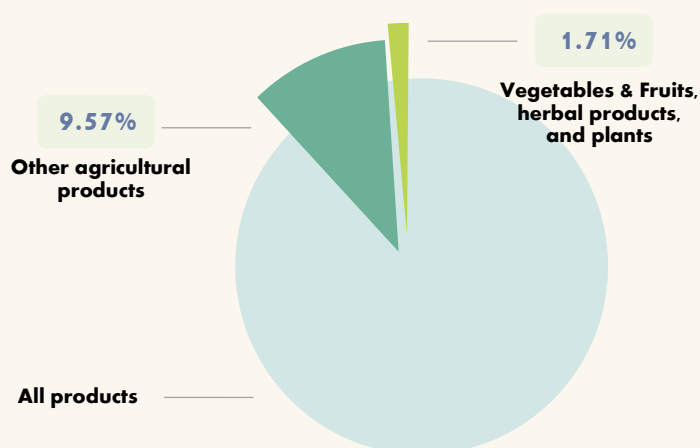
This study was carried out to identify demographic factors affecting consumer behavior across the three product categories: **fruits and vegetables, herbal products, and plants** in the Netherlands.

Questionnaires were used to obtain relevant information from respondents at the Thailand Pavilion during the International Horticultural Exposition (EXPO 2022 Floriade Almere). There were 395 participants randomly selected to answer the questionnaires using a convenient sampling method.

The study was examined using descriptive statistics such as frequency and mean. The relationship between the demographic factors and the purchasing behavior of the above-mentioned products was analyzed using a chi-square test of independence.

In addition, due to the limited number of questions, the Apriori algorithm¹ was used to generate association rules showing correlations found from the most frequent product combinations. This technique allows us to identify the products customers regularly purchase together. The findings of this study are beneficial for Thai businesses to segment the target market and leverage this trait to expand their marketing strategies and strengthen their product positions.

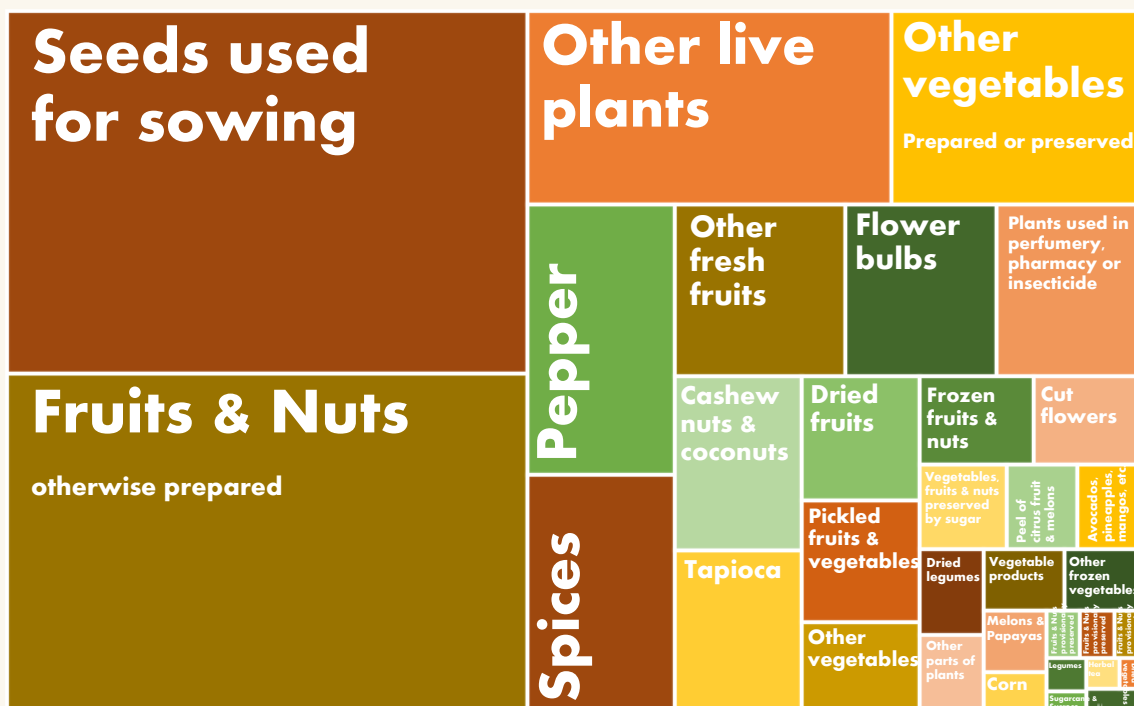
The Netherlands is one of Thailand's biggest trading partners and a vital distribution hub in Europe. Eurostat reported that in 2021 Thailand exported a total of 5.2 billion euros to the Netherlands, ranked second after Germany (5.3 billion euros).



This chart represents the distribution of the export value from Thailand to the Netherlands. Agricultural products are among the largest exported goods with a contribution of 11.28% valued at 600 million euros.

¹ Apriori algorithm is a data mining technique used to find frequent itemsets in a dataset and generate association rules.

The table below features examples of fruits and vegetables, herbal products, and plants. These exported products accounted for 1.71%, amounting to 89 million euros.



Thai vegetables and tropical fruits

86.84%
of buyers aged between 25-34 years
old purchased Thai vegetables



There was a significant relationship between age and Thai vegetable purchases (Chi-square=10.64, $p=.309$), with the highest prevalence in Gen Y or Millennials.

These findings are in line with the increasing interest in Asian Street Food-inspired flavors among Millennials in Europe, reported by Fi Global Insights, as they are considered a healthier food choice containing a lot of vegetables and healthy condiments.

The recent study by ProVeg² in 2021 also confirmed the popularity of the flexitarian diet lifestyle³ in Europe, with the highest share seen in the Netherlands. Around 42% of them were reported to have a flexitarian diet.

² A survey project (2021) titled "What consumers want: a survey on European consumer attitudes towards plant-based foods" as part of the Smart Protein Project funded by the European Union.

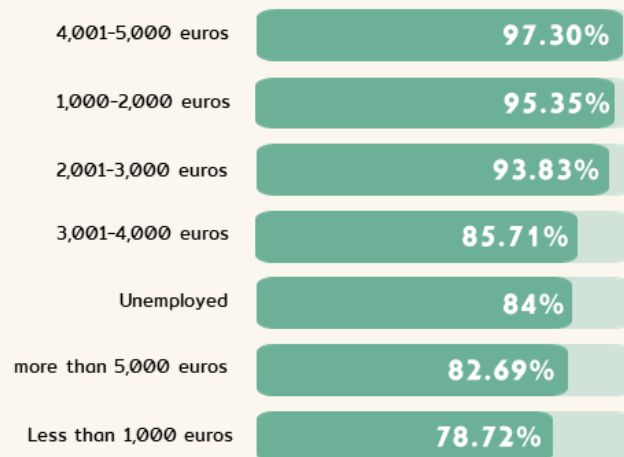
³ A mostly vegetarian diet, with a moderate combination of animal protein.

The relationship between average monthly income and tropical fruit purchases was found (Chi-square = 14.18, $p = .027$). The study showed that most tropical fruit buyers were more affluent than the average Dutch household, with an average monthly income between 4.001 – 5.000 euros.

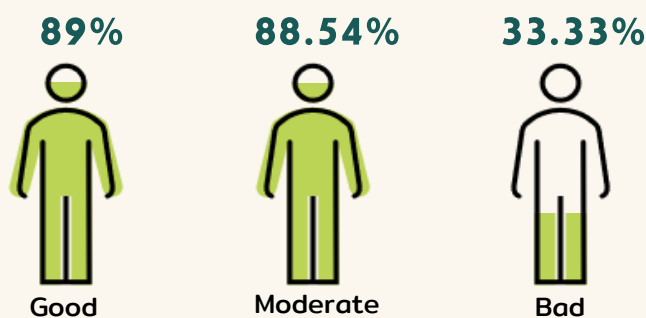
Those with an average income lesser than 1.000 euros had the lowest share of tropical fruit purchases. Irregular tropical fruit buyers viewed that tropical fruits were more costly than locally grown ones.



97.30%
of respondents having average
income between 4.100 – 5.100
euros purchased tropical fruits



**Healthy respondents were likely
to purchase more tropical fruits
than unhealthy ones.**



In addition, respondents having good and moderate health conditions were likely to purchase more tropical fruits than those having bad health conditions.

The study showed that respondents having good health conditions had the highest share of tropical fruit purchases, accounting for 89%. A slightly lower proportion (88.54%) of respondents having moderate health conditions was reported to purchase tropical fruits.

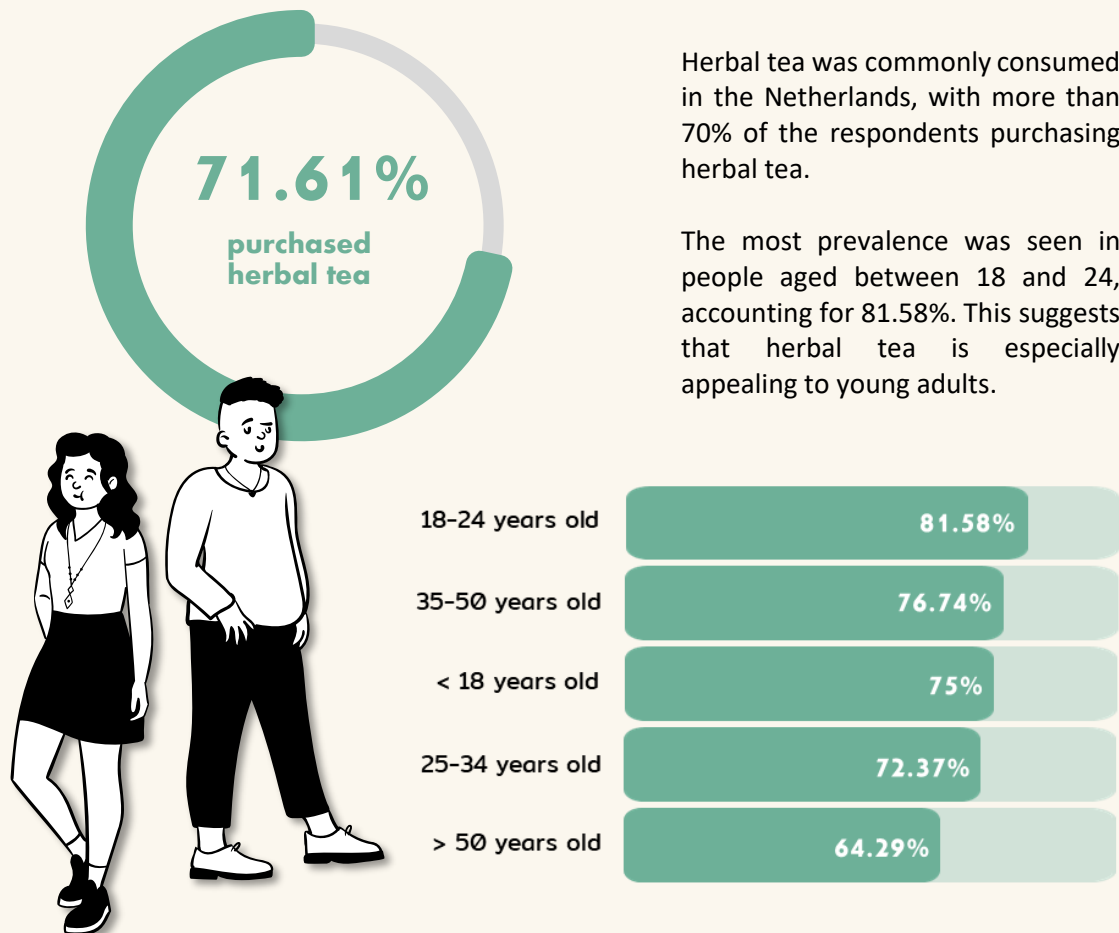
The opposite trend was observed in fruit purchases by respondents who had bad health conditions. Only a third (33.33%) reported purchasing tropical fruits. Non-buyers viewed that tropical fruits contained a high amount of sugar and calories. Businesses should consider addressing this concern to capture this group of customers.

Although the findings suggested that Thai vegetables and tropical fruits were commonly consumed in the Netherlands, Businesses should consider growing product penetration through online distribution channels to increase product visibility because most respondents (32.46%) found that it was not easy to find the products.

32.46%
of respondents said that it was
difficult to find Thai vegetables
and tropical fruits

E-commerce channels offer many advantages such as convenience and variety. Ekoplaza (an online organic online grocery) and HelloFresh (an online meal kit service) were given as examples of distribution channels frequented by the respondents.

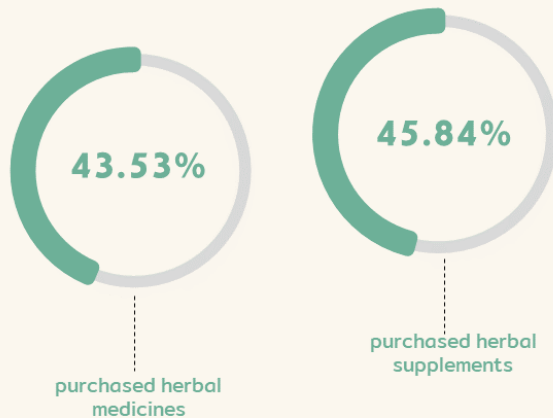
Herbal medicines, herbal supplements, and herbal tea



According to the results of the association analysis, the purchase pattern of herbal products suggested that respondents who normally consumed herbal tea would be less likely to purchase other types of herbal products. There was just a 50% chance of people who purchased herbal tea would buy herbal medicines or herbal supplements.

about 50%
of respondents who purchased
herbal tea would buy herbal
medicines or herbal supplements.

Herbal tea consumers did not think that it was necessary to use herbal medicines or herbal supplements as herbal tea already had medicinal properties. Therefore, Thai businesses may consider introducing herbal products in the form of supplement drinks and functional beverages as entry points instead.



Herbal medicines and herbal supplements were less popular among Dutch respondents.

Less than half of them reported purchasing either herbal medicines or herbal supplements.

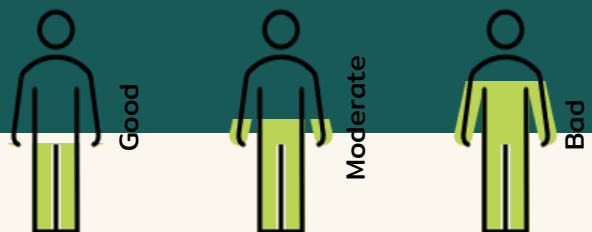
However, the study found that there was a relationship between the adoption of herbal medicines and supplements and health conditions.

Respondents who reported having bad health conditions consumed more herbal medicines and supplements than those having good and moderate health conditions. It can be reasoned that regular herbal product users are aware of the health and wellness benefits of herbal medicines and supplements.

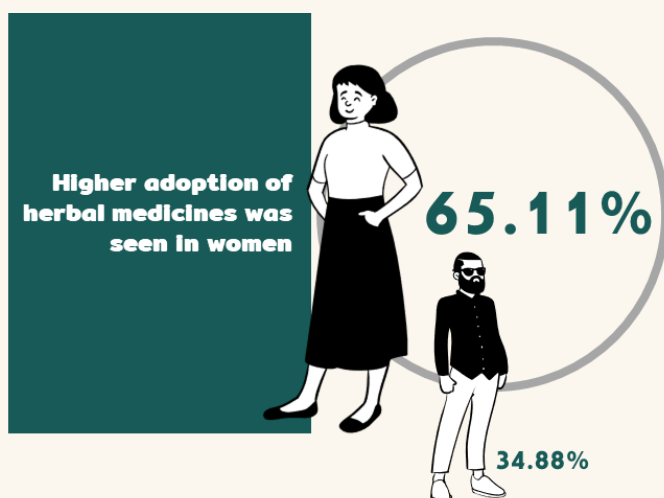
This result corresponded to the purchase pattern of herbal medicine and herbal supplements. The association rules analysis stated that 73% of herbal supplement buyers would also buy herbal medicines.

73%
of respondents who purchased
herbal supplements would
also buy herbal medicines

**Unhealthy people were likely to use more
herbal medicines and herbal supplements
than healthier ones.**



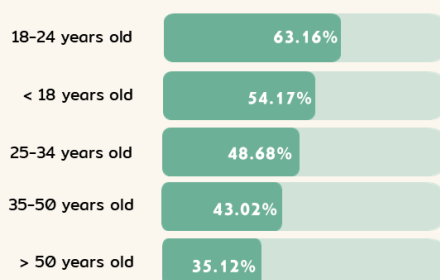
The adoption of herbal medicines was also associated with gender (Chi-square = 5.87, $p = .015$). According to the study, the highest prevalence of herbal medicine use was observed in female respondents.



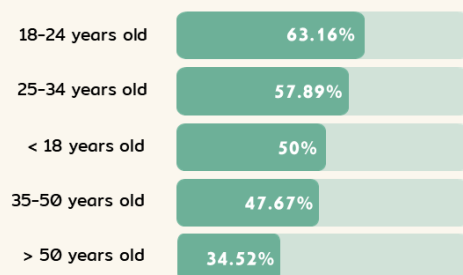
This result shares the same observation by Eurostat in 2019 that women used more prescribed medicines and non-prescribed medicines (vitamins, minerals, and tonics) as compared to men, accounting for 48.3% (42.8% in men) and 49.6% (33.5% in men) respectively.

Association was also found with regards to age and herbal product purchases – both herbal medicines (Chi-square = 12.73, $p = .013$) and herbal supplements (Chi-square = 17.99, $p = .001$). The study found that people aged 18-24 years old had the highest share of herbal medicine and supplement purchases, with approximately 63% of respondents aged 18-24 years old purchasing herbal medicines and supplements. It is also found that younger generations utilized herbal medicinal products for the treatment of coughs and colds.

Herbal Medicine Consumption



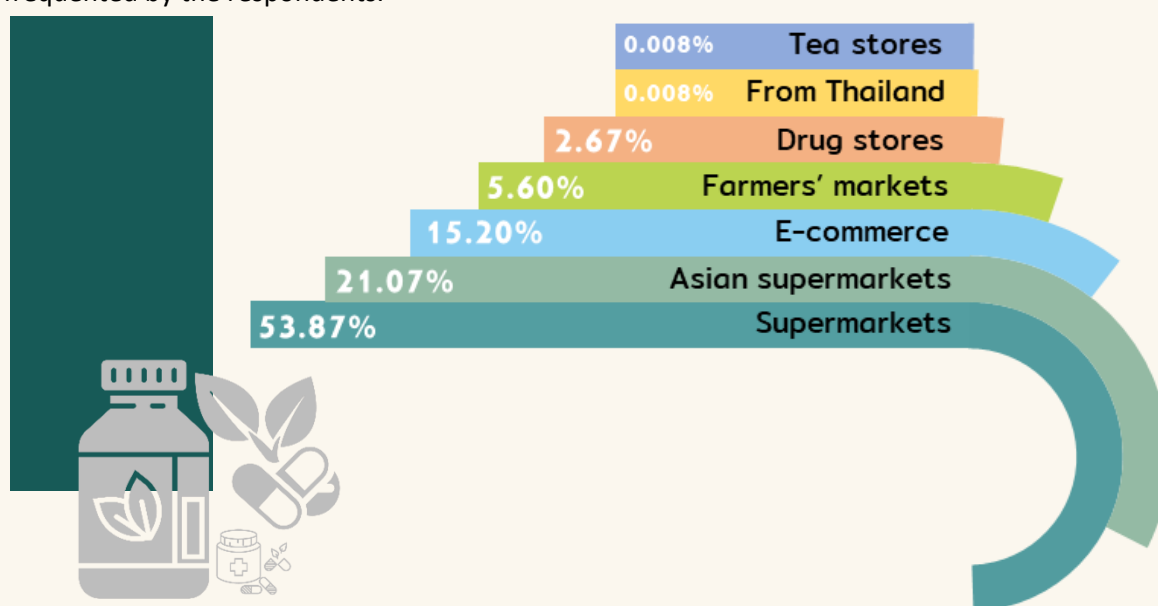
Herbal Supplement Consumption



To strengthen product positioning, brand credibility is essential to developing strategies for healthy brands. Businesses must be aware that commercial communications using health claims need to be scientifically substantiated to ensure the highest consumer protection.

Thai businesses should also consider selling products through both trusted offline and online distribution channels known among health-conscious consumers such as local supermarkets and E-commerce sites. The study found that supermarkets and Asian supermarkets earned the top location for buyers, accounting for 53.87% and 21.07% respectively while approximately 15% of respondents purchased herbal products online.

Ekoplaza, gezondheidswinkel.nl, and hollandandbarret.nl were given as online site examples frequented by the respondents.



Orchids, flowering plants, and tropical plants

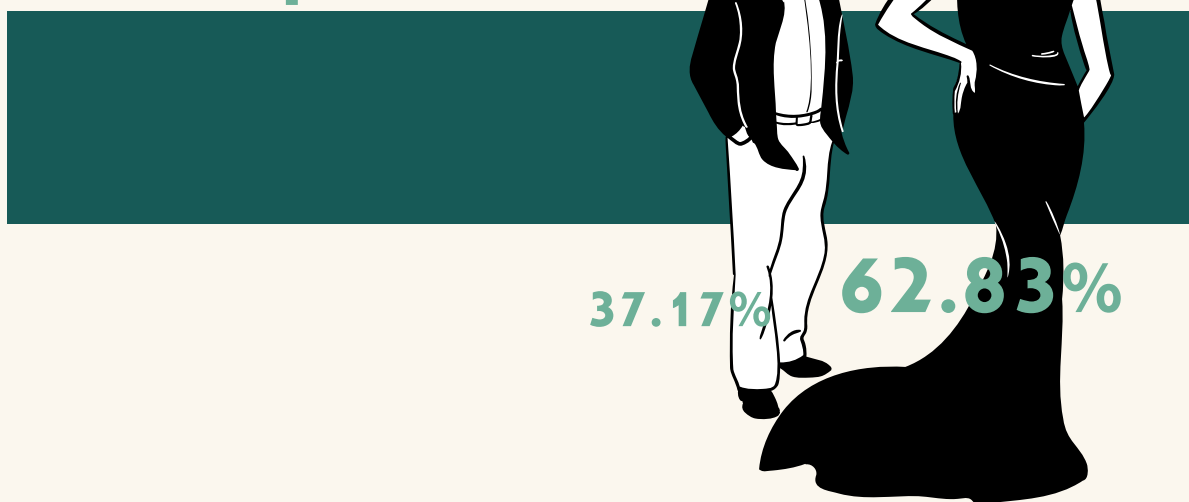


Orchids were the most purchased plant category and were most often bought as gifts.

Most orchid buyers viewed orchids as elements of interior décor thanks to their colors and long-lasting bloom.

The study found that gender was associated with orchid purchases (Chi-square = 4.67, $p = .031$), with a significantly higher share of female buyers than men. More than 60% of women purchased orchids, whereas around 37% of men purchased orchids.

Orchid purchases



Although most orchid and other flowering plant buyers shared the same age segment (more than 50 years old), orchid buyers had quite a low chance of purchasing flowering plants. The association analysis indicated that there was only a 50% chance that orchid buyers would also buy flowering plants. Hence, businesses must carry out studies to differentiate buyers of these two products to create information that resonates well with the target customers.

about 50%

of respondents who purchased
orchids would buy flowering
plants





Association was also found between having pets and tropical plant purchases (Chi-square = 4.44, $p = .035$).

Around half of the pet lovers purchased tropical plants, accounting for 50.92%.

The respondents felt that pets and plants aided their mental health during the pandemic.

It is evident from the study that there is a deepened plant appreciation among buyers aged 35 years old and older.

While most plant buyers spent around 50-100 euros per purchase, around 20% of buyers aged between 35-50 years old spent up to 200 euros per purchase.

The highest spending was found in buyers aged more than 50 years old. Despite a very low proportion, they paid more than 500 euros per purchase.

Average plant spending: 50-100 euros per purchase

The findings of this study showed that price was not an important aspect of purchasing decisions. Only 10% of respondents said that the product was expensive.

Preferences and abilities to take care of the plants are crucial when it comes to plant selection, accounting for 47.96% and 22.76% respectively. Businesses should then consider providing plant care information and growing instructions on plant labels.

Apart from garden centers, it is also important to note that some plant buyers also engaged with e-commerce retailers on Facebook, and eBay to purchase exotic species and obtain information on the latest species. Thai businesses should then consider setting up a presence on these social selling platforms to showcase the products and reach new audiences.

