INTRODUCTION

Street vended foods (SVF) is classified as food and beverages prepared and sold on streets and in public places for immediate consumption World Health Organization. Due to its convenience, economy, and pungent flavor, SVF gain a lot of popularity among consumers worldwide, more than 150,000 kinds of SVF are being consumed in China alone (Lin et al., 2017). However, most SVF are prepared in outdoor conditions and commonly encountered with the poor hygiene, improper sanitation, and lack of clean water (Ryu et al., 2011). During the preparation and distribution process of SVF, there is a high risk of foodborne disease, because of the questionable quality of raw materials, poor environment, infrastructure, preparation, and the personal hygiene of the food handlers (Islam et al., 2015; Mepba et al., 2007).

Previous studies had shown that some SVF exceeded the local total plate count and total coliforms standards in some countries (Manguiat & Fang, 2013; Noor, 2016), and some pathogenic bacteria were found (Manguiat & Fang, 2013). In addition, fried, grilled, and barbecued foods are the most frequently consumed SVF in China.
recent years. A variety of chemical reactions (hydrolysis, oxidation, and polymerization) occur while oil high-temperature cooking, lead to poor quality of oil, these raise more considerable attention (Rose et al., 2015). It has been reported that the polar compound, chemical, and physical properties of oils from some SVF did not meet certification standards (Bou et al., 2012). On the other hand, the consumption of SVF was closely related to the intake of fats, saturated fatty acids, and trans-fatty acid, as well as the occurrence of obesity and noncommunicable diseases (Steyn et al., 2014). Besides, the heavy metals concentration in some SVF exceeded the tolerable daily intake (Hariri et al., 2015). Simultaneously, the quality issues including nonpermitted colors, artificial sweeteners, adulterant oils, and poor sanitary quality were found in some SVF (Chandrasekhar et al., 2003).

The quality of SVF is a critical issue in densely populated areas such as university campuses, many college students tend to consume the SVF and are easy to buy from retail or mobile stores near the campus (Kim et al., 2013; Nyenje et al., 2012). In China, there are 2,956 universities, and more than 28 million college students (Statistics, N. B. o, 2020). The consumption of SVF in Chinese college students is very considerable and increasing constantly. Consequently, it is necessary to conduct a systematic evaluation of SVF quality around Chinese university campuses. Although some studies have assessed the microbial quality of SVF, the available information on its microbial contamination and oil quality is still little.

Based on the potential hazards of the SVF, this paper analyzed the physical, chemical, and microbial qualities of SVF near a university in Kunming city, China. Our work can provide some valuable suggestions for the dietary reference of college students and could be useful for authorities to improve SVF management strategies, and develop sanitation rules.

2 | MATERIALS AND METHODS

2.1 | Samples collection

The SVF samples were collected from the fixed and floating stalls around a university located in Kunming city, China, from September to October 2019. In brief, 133 different SVF samples (about 200 g/each sample) were randomly collected, comprising salads, pasta, soy products, fries, and grilled or baked snacks. The samples were wrapped in sterile polyethylene bags and immediately transported to the refrigerator (4°C). The microbial quality, oil quality, proximate composition, and heavy metal content of samples were analyzed within 24 h.

2.2 | Microbiological measurement

According to the types of preparing methods, the samples were subdivided into 5 groups namely fully cooked food, fully cooked food with minimum handling prior to consumption, multi-ingredients preparations, raw vegetables (fruits) ready for consumption, and Handmade drinks (Table 1). The aerobic plate count (APC) and Escherichia coli (E. coli) count were enumerated according to the procedures described by Ng et al. (2013). In brief, samples (25 g) were cut into pieces with sterile scissors, then 225 ml of physiological saline solutions were added and made a ten-fold dilution, then the suspensions were homogenized using a high shear homogenizer (Dalong, China) at 2.810 g for 1 min. The 100x dilutions were obtained using the same method. (a) APC count: 1 ml of dilutions were added in soybean casein agar medium, after incubation at 37°C for 1-2 days, the colonies between 30 and 300 of the plates were counted. (b) E. coli count: 1 ml diluted liquid was plated and incubated at 32°C for 2 days on E. coli count Petri film plates (3 M) under aerobic conditions. After the completion of incubation, plates were counted on a standard colony counter. The number of APC and E. coli were converted to log CFU/g or ml.

2.3 | Proximate composition analysis

The moisture, fat, protein, and ash of samples were analyzed using the standard procedures of the AOAC (2000).

2.4 | Chemical parameter analyses of oils

The lipid samples were extracted with petroleum ether (boiling point 30–60°C) and dried using a rotary evaporator at 40°C for further analyses (Chen et al., 2018). The acid value (AV) and peroxide value (POV) were determined according to AOCS and expressed as mg/g sample (AOCS, 2017). The carbonyl group value (CGV) was determined by the dinitrophenyl hydrzine (DNPH) method and expressed as mmol/g sample (Endo et al., 2001). The thiobarbituric acid (TBA) value was determined according to the previous method and expressed as mg malonaldehyde (MDA)/kg sample (Chen et al., 2018).

The inhibitions of the antioxidant activity were measured according to the published method (Kamel & El Sheikh, 2012).

2.5 | Analyses of color index, viscosity, and conductivity of oil

The color indexes of extracted oils were determined by measuring the absorbance of 2.5% oil (oil in isooctane, w/v) at 470 nm (Yoshida & Kajimoto, 1989). The color parameters including L*, a*, b* value of oil were measured using a colorimeter (Beituo SC-80) according to the previous report (Krokida et al., 2001). The viscosity was measured at room temperature using a rotary viscosimeter (Jingke DJ). Conductivity was determined according to the report of Li et al. (2016). In brief, 20 g extracted oil was mixed with 50 ml deionized water in a separating funnel (250 ml) at room temperature, the mixtures were stirred for approximately 5 s and held for 5 min, then conductivity was measured using the conductor (Shengxi DDSJ-308A EC).
2.6 | Heavy metal analyses of the food samples

The heavy metal (Cd and Pb) contents were determined by a graphite furnace atomic absorption spectrophotometer (Pu Analysis TAS-990) with Zeeman background correction (Ay & Karayunlu, 2008). In addition, the inductively coupled plasma mass spectrometry (ICP-MS) (Thermo Scientific) was used to measure the content of Hg and As (Yim et al., 2017).

2.7 | Statistical analysis

The analysis was carried out in triplicates for all determinations and the results of the triplicate were expressed as mean ± standard deviation (SD).

3 | RESULTS

3.1 | Microbial analysis of SVF samples

Figure 1 showed the numbers of APC and E. coli of SVF. The results indicated that the average APC value of tested 5 group samples ranged from 3.41 to 4.37 log CFU/g or ml. According to the microbial standards set by the Chinese Population and Family Planning Commission, 13 of 74 samples (17.6%) were out of limits of APC. The highest exceedance was category 3 (multi-ingredients preparations), the lowest was category 1 (fully cooked food). The highest numbers of APC were found in category 4 (raw vegetables and fruits ready for consumption), whereas category 1 (Table 2).

The average number of E. coli ranged from 0.53 to 1.48 log CFU/g or ml (Figure 1), and the highest numbers of E. coli were observed at category 4, whereas category 1. According to the E. coli count standard from the Chinese Population (100 CFU/g or ml), 10 of 96 samples were out of limits of E. coli. The exceedance of E. coli from high to low is category 3, 4, 2, 5, and 1 (Table 3).
3.2 | Evaluation of oil qualities

As showed in Table 4, among all the fried snack samples, AV of fried fermented tofu (1.75 mg/g) was the highest, while pancake was the lowest (0.75 mg/g). According to the statistical results, 6.8% (9/133) fried food samples exceeded the AV standard, and the French fries showed the highest exceedance. These may be due to the fact that oils used in French fries tend to be frying temperature and reused frequently, 8.3% (11/133) fried food samples exceeded the POV standard, and barbecues showed the highest POV (14.97 meq/kg) and exceedance. The CGV (22.6 meq/kg) of fried steamed buns was the lowest (31.0%), this may due to the high cooking temperature of frying destroyed the polyphenols in oil resulting in reduced antioxidant activity. Figure 2 presents the antioxidant activity of SVF samples. As showed in the figure, antioxidant activity of fried fermented tofu was the lowest (31.0%), this may due to the high cooking temperature of frying destroyed the polyphenols in oil resulting in reduced antioxidant capacity.

From Table 5, the absorbance value at 470 nm of oils extracted from SVF samples ranged from 0.189 to 0.422. Among the fried snack samples, barbecue showed the highest absorption value while fried rice showed the lowest value. Correspondingly, L’ value (30.29) of barbecue was the lowest, a* value (18.97) of fried drumstick and b* value (33.20) of fried fermented tofu were the highest, these results indicated that the color of the barbecue, fried drumstick, and fried fermented tofu had darkened by nonenzymatic browning during the cooking process. The viscosity of oils extracted from SVF samples ranged from 51.0 to 71.0 mPa s, and the French fries showed the highest viscosity. The viscosity result was corresponding to the results of acid value. As shown in Table 5, conductivity of oils ranged from 11.93 to 26.28 μS/cm, and French fries had the highest conductivity, these findings were corresponding to the results of acid value and peroxide value.

3.3 | Evaluation of proximate composition

The proximate composition of SVF samples was shown in Table 6. The moisture content ranged from 9.22% to 50.61%. The moisture content of fried drumstick and fried rice noodles were significantly higher than other samples, and the French fries was the lowest value. The difference of water content was mainly caused by the different water content of raw materials and the different preparation methods. Therefore, the low moisture content of French fries may cause by the moisture losing during deep frying. The ash contents of SVF ranged from 0.40% to 1.82%. Among the SVF, ash contents of fried fermented tofu and barbecue were higher than other samples, which may be due to the rich mineral content of soybean and meat. The fat content of tested samples varied from 10.32% to 47.30%. The fat content of French fries was significantly higher than other samples, mainly due to potatoes absorb more oil during deep frying. In general, fat content of fried food samples is relatively high (>10%).

With respect to protein content, the fried fermented tofu and fried drumstick were rich in protein, while the fried rice and rice noodles showed the lowest protein content, which was determined by the composition of the raw materials. In other words, the higher level of bean and meat, the higher protein content of SVF.

3.4 | Evaluation of heavy metal content

The four heavy metals contents of selected SVF samples were presented in Table 7. The levels of arsenic ranged from 0.012 to 0.051 mg/kg. The highest and lowest levels of arsenic were found in barbecue and French fries, respectively. The permitted limit of arsenic is 0.5 mg/kg set by the National Health and Family Planning Commission (NPFPC) (2017). As showed in Table 7, all of the samples met the arsenic permitted standard.

In terms of mercury content, fried drumstick had the highest mercury content (0.019 mg/kg), while fried fermented tofu had the lowest mercury content (ND) (Table 7), which may be due to the difference in Hg content in the recipes. Such as 1 of 15 (6.7%) tested fried rice samples, and 1 of 14 (7.1%) barbecue exceeded the standard set by the NPFPC (2017) (Table 8).

Among all samples, the Cd level of fried fermented tofu was the highest (0.073 mg/kg) and French fries was the lowest (0.012 mg/kg) (Table 7). According to standards set by the Ministry of Health of China, Cd content in grain, peanut, and meat products should not exceed 0.1 mg/kg, and soybean products should not exceed 0.2 mg/kg.

**TABLE 2** Incidence and levels of aerobic plate count (APC) in the food samples

| Groups | n  | Sample (%) meet standards | Percentage (%) of samples in the indicated intervals (log CFU/g or ml) | Range (log CFU/g or ml) | Mean (log CFU/g or ml) |
|--------|----|---------------------------|---------------------------------------------------|------------------------|-----------------------|
|        |    |                           | <3       | 3–4     | 4–5     | >5       |                        |                        |
| 1      | 14 | 92.9                      | 21.4     | 57.1    | 14.3    | 7.2      | 2.20–5.56              | 3.41 ± 2.07            |
| 2      | 22 | 81.8                      | 9.1      | 40.9    | 36.4    | 13.6     | 1.94–6.72              | 3.51 ± 1.40            |
| 3      | 22 | 77.3                      | 4.5      | 31.8    | 45.5    | 18.2     | 2.41–7.43              | 3.95 ± 2.01            |
| 4      | 22 | N/A                       | 4.5      | 18.2    | 40.9    | 36.4     | 3.38–6.91              | 4.37 ± 1.29            |
| 5      | 16 | 81.3                      | 12.5     | 56.3    | 25.0    | 6.2      | 2.64–5.99              | 3.48 ± 1.08            |

*Group 1, fully cooked food, Group 2, fully cooked food with minimum handling prior to consumption, Group 3, multi-ingredients preparations, Group 4, raw vegetables and fruits ready for consumption, Group 5, handmade drinks.*
fertilizers, and pesticides. pollution in food-growing fields, and abuse of the sewage sludge, material contamination in foods which can reflect the total hygienic quality of SVF, the E. coli can be used to represent the fecal pollution. Generally, the APC is used to evaluate the hygienic quality and bacterial contamination in foods which can reflect the total hygienic quality of SVF, the E. coli can be used to represent the fecal pollution. If E. coli was detected in foods, it may indicate that there were also other pathogenic intestinal flora existed, such as salmonella (Metz et al., 2020).

APC results suggested that some SVF like category 4, 3, and 2 were susceptible to bacterial contamination, which may be caused by sterilization instruction, handng methods, preserving conditions, personal hygiene of counter-tops (Sibanyoni & Tab it, 2019). Meanwhile, the microbial population was affected by the temporal relationship between food preparation and service (Marzano & Balzaretti, 2013). In addition, the unheated foods such as salad were generally served raw and naturally contaminated may contain high levels of microorganisms that can cause excessive levels of APC and E. coli.

In the present study, APC numbers of tested SVF samples were near those reported in Korean elementary schools, which indicated that 15% of nonheated foods and 9% of heated/nonheated food samples were not meet food standards (Ryu et al., 2011).

TABLE 3  Incidence and levels of Escherichia coli (E. coli) in the food samples

| Groups | n | Sample (%) meet standards | Percentage (%) of samples in the indicated intervals | Range (log CFU/g or ml) | Mean (log CFU/g or ml) |
|--------|---|--------------------------|---------------------------------------------------|------------------------|------------------------|
| 1      | 14 | 92.9                     | <3: 14.3                                          | 0–2.04                 | 0.53 ± 0.35            |
| 2      | 22 | 95.5                     | 3–4: 50.0                                         | 0–2.08                 | 0.97 ± 0.50            |
| 3      | 22 | 86.4                     | 4–5: 28.6                                         | 0–3.08                 | 1.16 ± 0.78            |
| 4      | 22 | 81.8                     | >5: 7.1                                           | 0–2.26                 | 1.48 ± 0.66            |
| 5      | 16 | 93.8                     |                                                    | 0–2.12                 | 1.22 ± 0.35            |

*Group 1, fully cooked food, Group 2, fully cooked food with minimum handling prior to consumption, Group 3, multi-ingredients preparations, Group 4, raw vegetables and fruits ready for consumption, Group 5, handmade drinks.

TABLE 4  Quality parameters of lipid extracts obtained from fried snack samples

| Samples                | n   | AV mg/g | ESR of AV | POV meq/kg | ESR of POV | CGV meq/kg | ESR of CGV | TBA value | ESR of TBA* |
|------------------------|-----|---------|-----------|------------|------------|------------|------------|-----------|------------|
| Fried rice noodles     | 20  | 1.07 ± 0.12 | 0 | 8.67 ± 0.79 | 0 | 12.8 ± 0.5 | 0 | 0.29 ± 0.01 | 0 |
| Fried drumstick        | 12  | 1.21 ± 0.06 | 8.3 | 12.61 ± 0.76 | 8.3 | 10.4 ± 1.0 | 16.7 | 0.41 ± 0.00 | 0 |
| Pancakes               | 18  | 0.75 ± 0.09 | 5.6 | 10.24 ± 0.51 | 5.6 | 9.7 ± 1.0 | 5.6 | 0.38 ± 0.00 | 0 |
| Fried steamed buns     | 7   | 1.19 ± 0.14 | 14.3 | 14.18 ± 1.55 | 28.6 | 22.6 ± 2.0 | 28.6 | 0.81 ± 0.01 | 14.3 |
| Roasted rice cake      | 12  | 0.83 ± 0.07 | 0 | 3.94 ± 0.62 | 0 | 5.1 ± 0.4 | 0 | 0.26 ± 0.01 | 0 |
| Fried rice             | 15  | 0.92 ± 0.09 | 0 | 10.24 ± 0.88 | 0 | 11.1 ± 0.6 | 0 | 0.25 ± 0.00 | 0 |
| Fried fermented Tofu   | 16  | 1.75 ± 0.17 | 6.3 | 12.61 ± 2.84 | 12.5 | 12.8 ± 3.0 | 12.5 | 0.69 ± 0.03 | 6.3 |
| Barbecue               | 14  | 1.35 ± 0.12 | 14.3 | 14.97 ± 1.56 | 21.4 | 14.6 ± 0.4 | 28.6 | 0.58 ± 0.00 | 0 |
| French fries           | 19  | 1.25 ± 0.22 | 15.8 | 12.61 ± 1.42 | 10.5 | 16.6 ± 0.3 | 15.8 | 0.86 ± 0.03 | 10.5 |

Abbreviations: AV, acid value; CGV, carbonyl group value; ESR, Exceeding standard rate; POV, peroxide value; TBA, thiobarbituric Acid.
*Exceeding standard rate over 1 mg/kg.

kg. The Cd content of 1 of 16 (6.3%) fried fermented Tofu samples exceeded the standard (Table 8).

The lead content in the tested samples ranged from 0.011 to 0.088 mg/kg (Table 7). Among them, barbecue had the highest lead content, the fried steam bun had the lowest lead content. The maximum permissible limit of lead in grain, soybean, and meat products is 0.5 mg/kg, and the Pb content of 1 of 12 (8.3%) fried drumstick, 1 of 16 (6.3%) fried fermented Tofu, and 1 of 19 (5.3%) French fries exceed the permitted limit (Table 8), which may be related to soil pollution in food-growing fields, and abuse of the sewage sludge, fertilizers, and pesticides.

4  | DISCUSSION

4.1  | Microbial analysis of SVF samples

Generally, the APC is used to evaluate the hygienic quality and bacterial contamination in foods which can reflect the total hygienic quality of SVF, the E. coli can be used to represent the fecal pollution.
4.2 Evaluation of oil qualities

The acid value is the rancidity index of oils, which related to the quality evaluation and of conserving the method of oil. Peroxides, intermediate products, are produced during lipid oxidation, and easily decomposed into volatile and nonvolatile fatty acids, aldehydes, ketones, etc. The peroxy value can be used to characterize the hydroperoxides formed during oils frying/baking. In addition, carbonyl group value is often used as the index of peroxide content and rancidity degree, and TBA value could express as the degree of lipid peroxidation products which is used as the index of lipid peroxidation.

A portion of quality parameters of lipid extracts obtained from SVF exceeded the standards set by Chinese national standards Health (SAC, 2003), these may be attributed to the partial dehydration of food materials and the increasing oxidation of unsaturated fatty acids at the relatively high temperature of cooking or frying (Burgos-Edwards et al., 2017).

TABLE 5 Color index, apparent viscosity, and conductivity of lipid extracts obtained from fried snack samples

| Samples              | n   | Absorption At 470 nm | Chroma value | Viscosity mPa s | Conductivity μs/cm |
|----------------------|-----|----------------------|--------------|----------------|-------------------|
| Fried rice noodles   | 20  | 0.288                | 67.74 ± 0.02 | 13.30 ± 0.67   | 17.39 ± 0.42      | 52.5 ± 1.4        | 12.54 ± 0.06 |
| Fried drumstick      | 12  | 0.329                | 52.73 ± 0.05 | 18.97 ± 0.12   | 14.60 ± 0.28      | 60.9 ± 2.9        | 12.51 ± 0.04 |
| Pancakes             | 18  | 0.319                | 55.78 ± 0.12 | 3.15 ± 0.24    | 10.80 ± 0.54      | 53.2 ± 1.2        | 11.93 ± 0.07 |
| Fried steamed buns   | 7   | 0.369                | 40.77 ± 0.10 | 11.99 ± 1.01   | 26.56 ± 0.67      | 66.4 ± 1.3        | 14.34 ± 0.08 |
| Roasted rice cake    | 12  | 0.198                | 67.62 ± 1.17 | 7.82 ± 0.18    | 19.57 ± 0.36      | 53.7 ± 0.7        | 12.21 ± 0.07 |
| Fried rice           | 15  | 0.189                | 72.36 ± 2.71 | 1.63 ± 0.07    | 21.00 ± 0.55      | 51.0 ± 1.6        | 14.44 ± 0.09 |
| Fried fermented Tofu | 16  | 0.333                | 62.69 ± 0.62 | 5.43 ± 0.05    | 33.20 ± 0.47      | 68.6 ± 2.4        | 24.90 ± 0.11 |
| Barbecue             | 14  | 0.422                | 30.29 ± 0.45 | 12.25 ± 0.06   | 12.00 ± 0.26      | 55.3 ± 2.5        | 17.09 ± 0.06 |
| French fries         | 19  | 0.318                | 62.34 ± 0.98 | -3.38 ± 0.05   | 13.15 ± 0.44      | 71.0 ± 1.8        | 26.28 ± 0.10 |
ceeds maximum permitted value. For instance, arsenic is cytotoxic to many organs in the human body and usually causes neurasthenia, multiple skin lesions, and neuritis. Mercury can cause stomatitis and neuropsychiatric symptoms. Cadmium can accumulate in the kidneys and liver and cause cancer. Long-term consumption of leaded foods could cause serious damage to the blood and nervous systems, especially to children's health and intelligence.

Arsenic content in most SVF samples was relatively low, such as lower than 0.024 mg/kg in meat, 0.103 mg/kg in rice, and 0.036 mg/kg in beans (Li et al., 2011). With respect to mercury, Fried drumstick contain more Hg (Table 7) than meat products in Chile, and the Hg content (<0.001 mg/kg) of fried fermented Tofu was similar to that of boiled beans in Italia faculty cafeteria (Alberti-Fidanza et al., 2002). In terms of cadmium content, the averaged Cd content of fried fermented Tofu was a little higher than pulses consumed in Italia faculty cafeteria (0.04 mg/kg) (Alberti-Fidanza et al., 2002). In addition, the Cd content of fried drumstick and French fries were remarkably lower than the meat consumed in Italy faculty cafeteria (0.013 mg/kg) and potato chips sold in Turkey (0.64 mg/kg) (Alberti-Fidanza et al., 2002; Hariri et al., 2015). Furthermore, the Pb levels of tested barbecue were close to the pork belly consumed in Korean (0.08 mg/kg) (Ryu et al., 2011).

In the light of our researches, the levels of heavy metals in the SVF tested were mostly in line with Ministry of Health of China. The heavy metal level for SVF samples around the university was agreed with the literature reported for the same kind of samples around the country.

## 4.3 Evaluation of proximate composition

The difference of proximate composition of SVF was mainly caused by the different nutrient content of raw materials and the different preparation methods (Durazzo et al., 2019). In general, fat content of fried food samples is relatively high (>10%). Therefore, it is not conducive to human health with large amount intakes to fried foods. All in all, nutrients of SVF varied widely because of the recipe formulation and cooking methods, and but the fat content was generally higher.

## 4.4 Evaluation of heavy metal content

Heavy mental including arsenic, mercury, cadmium, and lead are toxic elements and often harmful to human body if their level exceeds maximum permitted value. For instance, arsenic is cytotoxic to many organs in the human body and usually causes neurasthenia, multiple skin lesions, and neuritis. Mercury can cause stomatitis and neuropsychiatric symptoms. Cadmium can accumulate in the kidneys and liver and cause cancer. Long-term consumption of leaded foods could cause serious damage to the blood and nervous systems, especially to children's health and intelligence.

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In the light of our researches, the levels of heavy metals in the SVF tested were mostly in line with Ministry of Health of China. The heavy metal level for SVF samples around the university was agreed with the literature reported for the same kind of samples around the country.

## 5 CONCLUSIONS

A certain proportion of samples did not meet the APC and E. coli standards, suggesting that the conditions for the preservation, processing, and hygiene of SVF should be improved. The local government should pay attention to the administration of street stall, and develop unified standards of whole restaurant foods. Some SVF contain too much fat, and qualities like AV, POV, and CGV of some oil were not satisfied with standards. In terms of heavy metal levels, some SVF exceeded the standards, but most analyzed samples had low-level content. The relative inconsistencies in the microorganism’s contents and fats quality should be given due attention.
Therefore, a balanced diet is highly recommended, such as reducing consumption of SVF around the university. For SVF producers, more efforts should be made to improve the sanitary conditions and awareness of food safety. Eventually, better management strategies and hygiene rules should be developed.

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CONFLICT OF INTEREST

No conflict of interest was declared by the authors.

ETHICAL APPROVAL

This study does not involve any human or animal testing.

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