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| **Table 1. Sequence of genes primers**  |
| **PPAR-α** | Forward | ATG GTG GAC ACG GAA AGC C |
| Reverse | CGA TGG ATT GCG AAA TCT CTT GG |
| **PPAR-γ** | Forward | TAC TGT CGG TTT CAG AAA TGC C |
| Reverse | GTC AGC GGA CTC TGG ATT CAG |
| **TGF-β** | Forward | CTA ATG GTG GAA ACC CAC AAC G |
| Reverse | TAT CGC CAG GAA TTG TTG CTG |
| **Nrf-2** | Forward | TTC CCG GTC ACA TCG AGA G |
| Reverse | TCC TGT TGC ATA CCG TCT AAA TC |
| **GAPDH** | Forward | ACAACTTTGGTATCGTGGAAGG |
| Reverse | GCCATCACGCCACAGTTTC |
| PPAR-α: Peroxisome proliferator-activated receptor alpha, PPAR-γ: Peroxisome proliferator-activated receptor gamma, TGF-β: Transforming growth factor beta, Nrf-2: Nuclear factor erythroid 2–related factor 2, GAPDH: Glyceraldehyde 3-phosphate dehydrogenase. |

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| **Table 2. General characteristics of DN patients in the two study groups**  |
|  | DOE (n=32) | Placebo (n=32) | P-value  |
| **Age (year)** | 61.53 ± 7.11 | 61.29 ± 8.77 | 0.905\* |
| **Sex (n)**Male Female | 12 (37.5)20 (62.5) | 10 (31.2)22 (68.8) | 0.595^ |
| **BMI (kg/m2)** | 30.77 ± 5.15 | 29.41 ± 4.34 | 0.263 |
| **Physical activity (Mets)** | 771.75 (42.37, 2674.87) | 1290.00 (297.00, 3810.70) | 0.611 |
| **Drugs****OHAs, Anti-DSLDs and Anti-HTNDs****Ins, Anti-DSLDs and Anti-HTNDs** | 1517 | 1715 | 0.703 |
| DOE: dried okra extract, BMI: body mass index, DN: diabetic nephropathy, Ins: insulin, OHAs: oral hypo-glycemic agents, Anti-HTNDs: Anti-hypertensive drugs, Anti-DSLDs: Anti-Dyslipidemic drugsMET: metabolic equivalent \* Obtained from Independent Samples t-test^ Obtained from Fisher's exact test |

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| **Table 3. Urine analysis and hs-CRP of DN patients in the two study groups** |
|  | **DOE (n=32)** | **Placebo (n=32)** | **Between-group changes, P-value** |
| **Urine protein (mg/24hrs)**Baseline EndMedian Dif (%change)P-value\*\* | 488 (139.25, 1084.44)491 (192.75, 1530.75)42.41 (0.61)0.184 | 450 (135, 1134)594 (180, 820)61.00 (32)0.186 | -14.0 (8.44%), 0.762##62.0 (20.9%), 0.573##, 0.880$, 0.917≠, 0.902▲ |
| **Urine creatinine (g/24hrs)**Baseline EndMean Dif (95%CI)P-value\* | 1.41 ± 0.371.45 ± 0.240.04 (-0.09, 0.17)0.550 | 1.30 ± 0.321.42 ± 0.210.11 (-0.009, 0.24)0.068 | -0.105 (-0.282, 0.072), 0.240#-0.029 (-0.146, 0.087), 0.614#, 0.859^, 0.677&, 0.648▼ |
| **hs-CRP (mg/L)**Baseline EndMedian Dif (%change)P-value\*\* | 0.78 (0.09, 1.58)1.95 (0.93, 4.19)1.03 (95)0.006 | 0.76 (0.10, 1.48)2.14 (1.40, 2.89)1.41 (178.4)0.002 | -0.03 (2.63%), 0.825##-0.07 (-8.8%), 0.863##, 0.499$, 0.135≠, 0.141▲ |
| AGE: advanced glycation end products; BMI: Body Mass Index; DN: diabetic nephropathy; DOE: dried okra extract; Dif: difference; hs-CRP: High-sensitivity C-reactive Protein;\*Obtained from Paired samples t-test\*\*Obtained from Wilcoxon rank-sum test# Obtained from Independent samples t-test ## Obtained from Mann-Whitney U test^ Obtained from ANCOVA, adjusted for baseline values (Model 1).& Obtained from ANCOVA, adjusted for model 1 plus age, changes in BMI, energy intake, and physical activity (Model 2).▼ Obtained from ANCOVA, adjusted for Model 2 plus changes in AGE (Model 3).$ Obtained from Quantile regression, adjusted for baseline values (Model 1).≠ Obtained from Quantile regression, adjusted for Model 1 plus age, changes in BMI, energy intake, and physical activity (Model 2).▲ Obtained from Quantile regression, adjusted for Model 2 plus changes in AGE (Model 3 for urine protein).▲ Obtained from Quantile regression, adjusted for Model 2 plus changes in HbA1c (Model 3 for hs-CRP). |

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| **Table 4. Glycemic parameters of patients in the two study groups** |
|  | **DOE (n=32)** | **Placebo (n=32)** | **Between-group changes, P-value** |
| **FBG (mg/dl)**Baseline EndMean Dif (95%CI)P-value\* | 158.28 ± 51.49138.64 ± 46.10-19.64 (-36.12, -3.16)0.021 | 116.86 ± 29.62129.79 ± 53.4612.92 (-8.87, 34.63)0.234 | -41.41 (-62.67, -20.16), <0.001#-8.85 (-33.97, 16.27), 0.485#, 0.529^, 0.577& |
| **Insulin (IU/mlµ)**Baseline EndMedian Dif (%change)P-value\*\* | 16.55 (6.53, 25.07)12.22 (5.99, 25.50)-1.63 (% -26.19)0.495 | 22.75 (12.51, 31.54)13.46 (7.63, 18.29)-9.06 (% -40.83)0.005 | -10.44 (-27.25%), 0.158##0.31 (-9.21%), 0.925##, 0.487$, 0.519≠ |
| **HOMA-IR** Baseline EndMedian Dif (%change)P-value\*\* | 2.42 (1.86, 6.06)3.48 (1.81, 5.48)0.10 (% 43.8)0.896 | 3.88 (2.65, 5.93)2.74 (1.47, 4.96)-0.77 (% -29.38)0.036 | -0.75 (-37.62%), 0.169##0.66 (9.95%), 0.425##, 0.480$, 0.864≠ |
| **HbA1c (%)**Baseline EndMean Dif (95%CI)P-value\* | 8.83 ± 2.048.20 ± 1.68-0.63 (-1.14, -0.11)0.018 | 7.91 ± 1.26 7.76 ± 1.40-0.15 (-0.46, 0.15)0.312 | -0.91 (-1.77, -0.05), 0.037#-0.43 (-1.21, 0.34), 0.270#, 0.506^, 0.935& |
| DOE: dried okra extract, Dif: difference, FBG: fasting blood glucose, HOMA-IR: homeostatic model assessment for insulin resistance, HbA1c: hemoglobin A1c\* Obtained from Paired sample t-test\*\*obtained from Wilcoxon rank-sum test# Obtained from Independent samples t-test ## Obtained from Mann-Whitney U test^ Obtained from ANCOVA adjusted for baseline variable (model 1)& Obtained from ANCOVA adjusted for baseline variable, age, change of BMI, change of energy intake, change of physical activity (model 2)$ Obtained from Quantile regression adjusted for baseline variable (model 1)≠ Obtained from Quantile regression adjusted for baseline variable, age, change of BMI, change of energy intake, change of physical activity (model 2) |



 

**Effects of DOE on genes expression level of PPAR-α, PPAR-γ, TGF-β, and Nrf-2 in DN patients**

DOE: dried okra extract, PPAR-α: peroxisome proliferator-activated receptor alpha, PPAR-γ: peroxisome proliferator-activated receptor gamma, TGF-β: transforming growth factor beta, Nrf-2: nuclear factor-erythroid factor 2-related factor 2, DN: diabetic nephropathy